GROWTH AREA FOR

SOUTH AND EAST MOORHEAD

ALTERNATIVE URBAN AREAWIDE REVIEW (AUAR) AND MITIGATION PLAN

Final Document
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Prepared for the City of Moorhead
as the Responsible Governmental Unit (RGU)

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Executive Summary

WHAT IS AN AUAR?

An Alternative Urban Areawide Review (AUAR) is authorized under Minnesota Rules Chapter 4410.3610 as an alternative form of environmental review for development projects. Generally, the AUAR consists of one or more development scenarios, an inventory of environmental and cultural resources, an assessment of the "cumulative" impacts that the development scenarios may have on these resources as well as public infrastructure services, and a set of mitigation measures that reduce or eliminate the potential impacts generated by the development. The AUAR is intended to address the "cumulative" impacts resulting from a sequence of related development projects as opposed to an Environmental Assessment Worksheet (EAW) or Environmental Impact Statement (EIS) which simply looks at a single project's impacts and does not attempt to outline mitigation initiatives.

WHY AN AUAR FOR THIS PROJECT?

An AUAR was chosen for the project area because it will provide a better framework for coordinating a number of future development projects that will occur over a long period of time, identifying potential impacts, and focusing on effective, efficient mitigation strategies.

HOW IS AN AUAR USED?

An AUAR is used as a tool to help parties interested in development within the project area understand the existing environmental and cultural resources present on a site prior to initiating detailed planning and design. It is also used to identify key initiatives that must or should be undertaken to minimize negative impacts generated by proposed development.

Any proposed development in the project area would need to be reviewed for consistency with the AUAR and Mitigation Plan. If a development plan is not consistent with these documents or other statutory requirements, the developer may need to conduct additional environmental documentation or review or request an amendment to the AUAR. Natural and cultural inventory information in the AUAR and the Mitigation Plan will be used to guide development. Design and construction would proceed only after all approvals and appropriate agreements are complete.

OVERVIEW OF THE AUAR PROCESS

City staff began exploring the concept of completing an AUAR for the project area in 2004 after the completion of its Comprehensive Plan. The City of Moorhead knew that many property owners and developers in the growth area had begun exploring development projects. Rather than evaluating projects individually, the City desired a comprehensive look at the potential impacts of full growth in the south and east areas. The City hired a consultant to assist with the preparation of the AUAR. The process followed the statutory requirements for completion of an AUAR.

DESCRIPTION OF THE DEVELOPMENT SCENARIO

The development scenario evaluated in the AUAR is based on the Growth Area Plan (GAP) prepared for the south and east growth areas of Moorhead. The GAP was developed as an implementation initiative to the Comprehensive Plan adopted by the City in 2004. General

directions for the GAP were established through the recently completed Comprehensive Plan, storm water plans, utility infrastructure plans, and regional transportation plan as provided by Fargo-Moorhead Council of Governments (Metro COG). Property owners and developers were integrally involved in the process providing input before alternatives were conceived and reviewing proposed alternatives to help converge on a preferred plan.

The GAP encompasses 3,710 acres on the south and east sides of the City of Moorhead. A mixture of residential, commercial, public/institutional, and park/open space land uses are proposed for the project area. At total build out it is anticipated that there will be a total of 10,630 unattached and 5,830 attached residential units. Full build out will also include over 3.3 million square feet of commercial and institutional uses. The GAP illustrates 740 acres of parks and open space which includes the necessary ponding for managing storm water runoff. The GAP also indicates future locations for neighborhood parks or tot lots which will need to be incorporated into subdivisions.

IDENTIFICATION OF POTENTIAL IMPACTS

Natural, Cultural and Physical Resources

Past and current land uses in the project area have primarily been agricultural. Some farmsteads exist which generally consist of a residential structure and various outbuildings such as barns, sheds or silos. Other uses include large lot residential development on individual septic systems and private wells, a couple of golf courses, and a campground.

The only National Wetland Inventory feature in the project area is the Red River of the North. Deciduous forest remains primarily along the Red River, although there are small stands of trees around farmsteads, large lot residential homes and as tree breaks in some agricultural fields. There is also some grassland found along the Red River, adjacent to Highway 52, and just north of the project area along the railroad tracks.

The topography within the project area is generally flat and is not composed of highly erodible soils. However, wind erosion can be of concern depending upon the season and weather. The potential for erosion of soils exposed during development of the project area will be minimized using Best Management Practices (BMPs) during and after construction. Specific erosion control practices will be identified in final grading and construction plans for each proposed development project. Developments will be required to meet as necessary the standards of the National Pollutant Discharge Elimination System (NPDES), the City of Moorhead, and the Buffalo Red River Watershed Management District.

The Red River of the North flows from west-central Minnesota north to southern Manitoba. The Red River supports a variety of fish and aquatic species, as well as provides the public drinking water supply for the City of Moorhead. It is currently considered impaired in the Moorhead area by federal standards because it does not meet water quality standards. Development in the project area has the potential to decrease water quality and impact aquatic habitat in the Red River if storm water is not managed adequately. The stormwater system illustrated by the GAP is intended to filter pollutants and reduce sediment loads on the Red River. The City is also actively establishing a greenway along the Red River to help prevent and reduce sediments from entering the river. The MPCA is currently studying the Red River to determine the total maximum daily load (TDML) for pollutants and strategies to reduce the loads to meet water quality standards. The City of Moorhead and other regional partners will continue to work with the MPCA in this study and implement measures to protect the Red River.

The soil characteristics of the Red River Valley have made it extremely fertile. However, these same characteristics have also made the banks of the Red River vulnerable to erosion and ground movement, such as slumping, creeping or earthflow. The rates of ground movement are influenced by a number of factors including soil moisture conditions, water levels in the river, and the actions of people such as the removal of the natural vegetation, weight of the homes and accompanying structures, and additional watering of landscaping. While the rates of ground movement may be difficult to predict, it is not difficult to predict that development too close to the Red River will be impacted by the area's geology. To best protect private and public investment, as well as ensure the City's future drinking water quality, development immediately adjacent the Red River should be limited and land should remain natural in protected park or open space areas.

Throughout history waterways, such as the Red River, have been a prevalent location for human settlement. Archaeological artifacts have been found near the banks of the Red River in various parts of the Fargo-Moorhead area. Since the Red River has meandered throughout its history, the potential for archaeological sites exist within about an eighth to a quarter mile of the river. The Minnesota State Historic Preservation Office (SHPO) indicates that the Red River Trail is an archaeological feature within a portion of the project area. Since a systematic survey of Moorhead has not been completed, a survey of the project area should be completed to assess whether there is the potential for archeological sites.

Municipal Infrastructure

The City of Moorhead is generally poised for development in the project area. The City is in the process of making improvements to its sanitary sewer collection system. The improvements include constructing a new third interceptor within the eastern part of the community, as well as modifying and extending the existing western interceptor. The improvements are anticipated to accommodate growth in all but the portion of the project area south of 50th Ave S. The current Wastewater Treatment Facility (WWTF) is expected to accommodate growth without improvements for approximately the next 15 years.

The municipally owned utility Moorhead Public Service (MPS) anticipates that a few improvements to the water supply system will need to be made after 2008. Although the exact timing is depending on the rate and type of growth, there will be a need for a water transmission line to be extended south across Interstate 94 and a new water tower. MPS is also currently working with regional partners to identify the potential water sources needed after 2015.

MPS has identified the future need for a 115 kilovolt (kv) transmission line south of Interstate 94 and a substation along 20th Street S. The new transmission line is proposed to be located as part of the green space corridor between 50th Ave S and 60th Ave S. The new transmission line would be located next to an existing 230 kv transmission line owned by Ottertail Power Company. While an exact location has not been determined, the new substation could be accommodated within the park and open space areas identified to the east side of 20th Street S and the railroad tracks.

Storm Water Management

Due to limited natural drainage in the project area a series of storm water management facilities will be needed. The conceptual storm water system was proposed with enough storm water runoff capacity to handle a 100 year, 24-hour event or 5.26 inches of rain in a 24-hour period. The ponds are proposed to be organic in design and used as natural amenities in parks and open space areas.

Traffic Related Impacts

Traffic will be generated by the future urbanization of southern and eastern portions of Moorhead. The City and Fargo-Moorhead Council of Government (Metro COG) maintain a long range transportation planning system that is poised to handle the increased traffic demands generated by new growth. Minor arterial roadways within the project area include Highway 75, 40th Avenue and 60th Avenue to the south, and 34th Street and 12th Avenue to the east. These roadways will carry between 8,000 to 21,000 vehicle trips per day within or adjacent to the project area. These roadways are designed or planned as 4 lane roadways with traffic management devices (signals and turn lanes) at key intersections to facilitate through movements and to maintain an acceptable and safe level of service. Local street systems will also be designed to facilitate through movements and alternative routes for traffic with local destinations. A system of parkways will provide an asset to development patterns in the growth areas and will also serve as a vehicle connection between public/civic destinations such as parks/open space areas, schools and neighborhood nodes. These parkways will have a narrow design with traffic management systems that discourage higher speeds and through traffic, but they will provide a pleasant driving environment. Outside of the project area and towards downtown Moorhead, congestion levels will increase, particularly along Highway 75 and 20th Street. Improvements to these roadways will be needed to accommodate the increased traffic volumes generated by the development. The long term nature of growth will enable the City to work with MnDOT to plan for improvements particularly as they pertain to interchange and overpass locations along I-94.

MITIGATION INITIATIVES

A Mitigation Plan is included at the end of the AUAR worksheet questions. The Mitigation Plan identifies key steps that the City will take to mitigate potential impacts identified in the AUAR. In addition to general mitigation initiatives, the mitigation plan includes strategies in the following areas:

- Natural and Physical Resources
- Cultural Resources
- Land Use Management
- Erosion Control and Sedimentation
- Water Supply and Appropriation
- Wastewater System
- Storm Water Management
- Traffic

Alternative Urban Areawide Review (AUAR) Worksheet Form

This section consists of the Environmental Assessment Worksheet (EAW) form and response to questions as modified by Environmental Quality Board (EQB) AUAR Guidance as of July, 2004. The EAW question is shown in bold uppercase text, AUAR guidance is shown in faded italicized text, and the response to the question is shown in regular text.

AUAR Guidance as Revised by EQB staff

This guidance has been prepared by the EQB staff to assist in the preparation of AUAR documents. It is based on the directive of 4410.3610, subp. 4 that "the content and format [of an AUAR document] must be similar to that of an EAW, but must provide for a level of analysis comparable to that of an EIS for impacts typical of urban residential, commercial warehousing, and light industrial development and associated infrastructure."

General Guidance

This guidance is based on the items of the standard EAW form (February 1999 version); the numbers listed below refer to the item numbers of that form. Except where stated otherwise, the information requested here is intended to augment (or clarify) the information asked for on the EAW form; therefore, the EAW form and the guidance booklet "EAW Guidelines" must be read along with this guidance.

The information requested must be supplied for each of the major development scenarios being analyzed, and it is important to clearly explain the differences in impacts between the various scenarios. If this guidance indicates that an EAW item is not applicable to the AUAR, the item # and its title (the text in bold print on the EAW form) should be included with an indication that the EQB guidance indicates that no response is necessary in an AUAR (as opposed to just skipping reference to that item at all).

One general rule to keep in mind throughout the preparation of the AUAR document is that whenever a certain impact may or may not occur, depending on the exact design of future developments, the AUAR should cover the possible impacts through a "worst case scenario" analysis or else prevent the impacts through the provisions of the mitigation plan. Failure to cover possible impacts by one of these means risks the invalidation of the environmental review exemption for specific development projects.

1. TITLE

Growth Area for South and East Moorhead

2. PROPOSER

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3. RGU

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4. REASON FOR EAW PREPARATION

Not applicable to AUAR.

Recently, the City of Moorhead has experienced increased demand for urban growth. In response to this demand, the City updated its Comprehensive Plan and implemented a strategy to master plan its future growth areas as directed by the Comprehensive Plan. This AUAR is being prepared to evaluate the potential future growth and its associated impacts on a cumulative basis rather than on a piecemeal basis as individual projects require or conduct environmental reviews. This is a discretionary AUAR completed by the City of Moorhead.

5. LOCATION AND MAPS

a. The country map is not needed for an AUAR.
b. The USGS map should be included.
c. Instead of a site plan, include:

(1) a map clearly depicting the boundaries of the AUAR and any subdistricts used in the AUAR analysis;
(2) land use and planning and zoning maps as required in conjunction with items 9 and 27
(3) a cover type map as required for item 10. Additional maps may be included throughout the document wherever maps are useful for displaying relevant information.

The AUAR Project Area is located on the south and east sides of the City of Moorhead. Figures 5.1, 5.2, and 5.3 show the project location. North of Interstate 94, the project area is generally located between 34th Street S and the municipal boundary. The boundary of the southwestern portion of the project area is between the Red River on the west, Highway 75 on the east, 46th Ave S on the north, and 60th Ave S on the south. The boundary of the south central and southeastern portions of the project area are between Highway 75 on the west, Highway 52 on the east, 46th Ave S on the south and no further north than Village Green Boulevard.

The project area has been divided into three different types of subdistricts: GAP districts, TAZ districts, and Sewer Districts. The Moorhead Growth Area Plan (GAP) identified four subdistricts shown in Figure 5.4 based on physical features, such as major roadways and railroad tracks. Figure 5.5 shows traffic analysis zones (TAZ) which were created to analyze traffic impacts as part of the GAP effort. The project area was also divided into the sewer subdistricts shown in Figure 18.1 to estimate wastewater flows as part of the GAP effort.

County: Clay
City: Moorhead
Locations: Section 6, Township 138, Range 48; Sections 10-11, 14-15, 20-23, and 26-32 of Township 139, Range 48; and Sections 25 and 36, Township 139, Range 49

The following figures are included within the AUAR:

Figure 5.1—Project Location
Figure 5.2—AUAR Boundary
Figure 5.3—USGS Map

Figure 5.4—Growth Area Plan (GAP) Districts
Figure 5.5—Traffic Analysis Zones (TAZ)
Figure 6.1—Growth Area Plan (GAP)
Figure 6.2—Existing Sanitary Sewer Service Area
Figure 9.1—Existing Land Use
Figure 9.2—Sites of Environmental Concern
Figure 10.1—Land Cover
Figure 10.2—Sensitive Environmental Features
Figure 10.3—Natural Resources Overlay
Figure 17.1—Proposed Storm Water System
Figure 18.1—Sanitary Sewer System (southwest of I-94)
Figure 18.2—Sanitary Sewer System (southeast of I-94)
Figure 18.3—Sanitary Sewer System (north of I-94)
Figure 19.1—Soils Map
Figure 21.1—Roadway System
Figure 21.2—2000 Average Daily Traffic (south of I-94)
Figure 21.3—2000 Average Daily Traffic (north of I-94)
Figure 21.4—Build Out Average Daily Traffic (south of I-94)
Figure 21.5—Build Out Average Daily Traffic (north of I-94)
Figure 25.1—Cultural Resources Overlay
Figure 27.1—City of Moorhead Comprehensive Plan
Figure 27.2—Clay County Comprehensive Plan

6. DESCRIPTION

Instead of the information called for on the form, the description section of an AUAR should include the following elements for each major development scenario included:
-anticipated types and intensity (density) of residential and commercial/warehouse/light industrial development throughout the AUAR area;
-infrastructure planned to serve development (roads, sewers, water, stormwater system, etc.) Roadways intended primarily to serve as adjoining land uses within an AUAR area are normally expected to be reviewed as part of an AUAR. More "arterial" types of roadways that would cross an AUAR area are an optional inclusion in the AUAR analysis; if they are included, a more intensive level of review, generally including an analysis of alternative routes, is necessary;
-information about the anticipated staging of various developments, to the extent known, and of the infrastructure, and how the infrastructure staging will influence the development schedule. Note: the RGU must assure that the development described complies with the requirements of 4410.3610, subpart 3 (and also that it properly orders the AUAR and sets the description in that order as required by 4410.3610, subpart 3).

The development scenario evaluated in this AUAR is the Moorhead Growth Area Plan (GAP). The GAP was developed as an implementation initiative of the Comprehensive Plan adopted by the City in 2004. The key purposes of developing the GAP were to:

- Establish a more detailed land use plan that achieves the vision elements of the Comprehensive Plan and serves as a guide to developers.
- Identify a logical system of major roadways connecting growth areas of the community.
- Establish a network of park and open spaces that link neighborhoods, provide a landscape amenity, and offer passive and active recreation areas.
- Identify a system for storm water management facilities that serves as an amenity and asset to the neighborhood.

General directions for the GAP were established through the recently completed Comprehensive Plan, storm water plans, utility infrastructure plans, and regional transportation plan as provided by Fargo-Moorhead Council of Governments (Metro COG). Property owners and developers were integrally involved in the process providing input before alternatives were conceived and reviewing proposed alternatives to help converge on a preferred plan.

The GAP encompasses approximately 3,710 acres on the south and east sides of the City of Moorhead. As Figure 6.1 shows, the GAP has a mixture of residential, commercial, public/institutional, and parks/open spaces. Based on the Comprehensive Plan and the Growth Area Plan, the types and intensities of development for each of the land uses will be:

- Low Density Residential – single-family detached housing is the predominant building type with a maximum density of 4 units per net acre.
- Low-Medium Density Residential – this category includes a mixture of single-family detached housing and attached units such as duplexes and twinhomes. The density per net acre should range from a minimum of 3 units per acre to a maximum of 5 units per acre.
- Medium Density Residential – the medium density designation is predominantly townhomes and condominiums, however it can include smaller lot detached and attached single-family developments. The density per net acre should range between 6 and 12 units per acre.
- High Density Residential – this category includes multi-unit and multi-building apartment complexes, as well as higher density townhome developments. The maximum building height is 4 stories so as to integrate with the surrounding area. The density per net acre should range between 12 units to 30 units per acre.
- Commercial – commercial development in the project area will range from neighborhood to regional in scale. The GAP identifies more specifically the type of commercial envisioned for particular areas. Neighborhood commercial development is generally 5 acres or less in size and has floor area ratios of 0.25 to 0.30. It typically provides convenience retail and services such as corner stores, coffee shops, salons, insurance and real estate offices. Community commercial land uses are 5 to 15 acres with floor area ratios of 0.20 to 0.25. These neighborhood centers include neighborhood commercial uses, as well as larger users such as a grocery store or sit-down restaurant. There are a few areas for regional commercial development in the project area. Regional commercial encompass 15 or more acres and have floor area ratios of 0.15 to 0.20. Regional commercial includes neighborhood and community commercial uses, as well as big box retailers. These shopping and entertainment centers draw more of a regional customer base. Incorporated within the commercial land use category are also offices. Larger office complexes are anticipated to be a part of the regional commercial areas.
- Public/Institutional—public/institutional land uses include schools, churches and government facilities such as police, fire, and libraries.

Development Staging

The City of Moorhead is poised for additional growth in the southern and eastern portions of the community. Aside from the improvements already underway, there are no specific infrastructure improvements that must be made for the initial stages of development. The timing of initial development will generally be based on the preferences of property owners and developers and consistency with City improvement projects already underway. The timing of later stages of development will be based on the City's ability to expand infrastructure capacity as guided by the City's Sanitary Sewer plans. The City of Moorhead will generally encourage growth in a contiguous fashion to maximize municipal investment; however, flexibility exists to accommodate property owners or developers who are ready to develop sooner. It is anticipated

that the project area will develop over the next 25 to 50 years depending upon market conditions. The feasibility to serve land area outside the existing service area (see Figure 6.2) is currently being evaluated by the City Engineers and consulting engineers Bonestroo Rosene Anderlik and Associates.

Water Supply Improvements

Moorhead Public Service (MPS), a municipal owned utility, has made significant improvements to the public water supply over the last few decades. These improvements have positioned the community to accommodate the future growth anticipated in the GAP in the near term. Future improvements would be needed however to serve growth in the longer term, particularly that area south of 40th Avenue and east of 20th Street. Two improvements have been identified as needed for the long term, including extending an existing 24 inch main from its current terminus at 20th Avenue South and Southeast Main across I-94 and adding a new water tower south of 40th Avenue. These improvements would not need to occur concurrently but phased in over time. The water tower feature would likely include a 3 to 4 acre parcel that could be accommodated in green space areas illustrated in the Growth Area Plan. The specific timing of these improvements will be dependent on the rate and type of growth experienced south of Interstate 94. MPS has allocated $1 million dollars in its capital budget for implementing one of these improvements.

Sanitary Sewer Improvements

The City of Moorhead is currently making improvements to its sanitary sewer collection system. The improvements include constructing a new third interceptor within the eastern part of the community, as well as modifying and extending the existing western interceptor. The improvements are anticipated to accommodate growth in all but a portion of the project area. The portion of the project area not shaded (in orange) in Figure 6.2 represents the area outside the existing sanitary sewer service area. Extension of services to this area will not be considered until development within the existing planned services boundary is near completion. The current Wastewater Treatment Facility (WWTF) is expected to accommodate growth without improvements for approximately the next 15 years. The City of Moorhead has the capacity to expand its sanitary sewer system to accommodate future growth and plans are already underway to ensure future capacity.

Electrical Service Improvements

MPS has identified a future need for a 115 kilovolt (kv) transmission line south of Interstate 94 and a substation along 20th Street S. The GAP illustrated the new transmission line as part of a green space corridor between 50th Ave S and 60th Ave S within the project area. The new transmission line would preferably be located next to an existing 230 kv transmission line owned by Ottertail Power Company in the Southwest GAP sub-district. See Figure 6.1 for an illustration of the greenway corridor in the southwest district intended to accommodate the future 115 kv transmission line.

Transportation Improvements

Transportation planning in the project area is done in collaboration with the City, County, and Fargo-Moorhead Council of Government. The GAP identifies future arterials, collectors, and parkways which will connect to the existing transportation system and accommodate projected development. As part of the GAP planning process, traffic generation was estimated and modeled in the area to determine long term impacts on the roadway network and to identify future planning needs. As this area develops, improvements to the transportation system will be needed to accommodate an expected increase in traffic volumes that will in some areas approach an

increase of 300% over existing traffic levels at full build out (expected to be 50+ years). Transportation system improvements will include acquisition of road right-of-way and construction of new roads, reconstruction and upgrading of existing roads and development of traffic management devices such as traffic signals and signage and extension of transit services to better serve the growth areas. Responsibility for these improvements will be dependent upon the roadway jurisdiction. For local roads improvement responsibility is principally the City of Moorhead. Highway 75 and intersections with I-94 will be the responsibility of MnDOT, while any County Roadways that are not turned back to the City will be the responsibility of Clay County and Metro COG. It is fully anticipated that planning and design of future improvements will be a collaborative effort amongst the three jurisdictions and Metro COG. The future roadway network is illustrated in Figure 21.1.

Storm Water Improvements

Storm water runoff will need to be managed as the area is converted from primarily agricultural fields to urban land uses. The GAP illustrates a conceptual storm water system with enough storm water runoff capacity to handle a 100 year, 24-hour event or 5.26 inches of rain in a 24-hour period. The storm water system was designed consistent with the engineering parameters established by the *South Moorhead Storm Water Management Plan* completed in 2004 by Houston Engineering, Inc. The South Moorhead Storm Water Management Plan is incorporated by reference and is available for review through the City of Moorhead Engineering Department.

Parks and Open Space

Both the City's Comprehensive Plan and GAP emphasize the amenity value and identity that parks and open spaces bring to neighborhoods and the community as a whole. The GAP identifies about 684 acres of land to be used for parks, open spaces, and stormwater ponding. This includes passive open spaces as well as regional parks. The GAP also identifies general locations for future neighborhood parks and tot lots. Parkways and greenways not only connect parks but also neighborhoods and commercial districts. The storm water management system is incorporated into the park and open space system as natural features and amenities.

AUAR Process

The Order for Review, ordering the preparation of the AUAR, was passed by Resolution, by the Moorhead City Council on Monday, December 6, 2004, consistent with the requirements of Minnesota Rules Section 4410.3610, subpart 3. An initial letter of introduction to the AUAR process was sent to 20 agencies to solicit relevant information to be considered in the AUAR. This letter, the list of agencies that received it, and any correspondence in response to this letter is included in Appendix B. Letters received in response to review of the AUAR Draft are included in Appendix C along with the City's response to the comments. The City Council held a public hearing on March 7th, 2005 and adopted the Final AUAR on March 21st, 2005. The final adopting resolution is included as Appendix D.

7. PROJECT MAGNITUDE DATA

The cumulative totals of the parameters called for should be given for each major development scenario, except that information on "manufacturing," "other industrial," "institutional," and "agricultural."

The project area encompasses approximately 3,710 acres in south and east Moorhead. At total build out it is anticipated that there will be a total of 10,630 unattached and 5,830 attached residential units. Full build out (anticipated to be 50 or more years) would also include over 3.3 million square feet of commercial and institutional uses. Building heights are anticipated to range from 1 to 4 stories which is compatible to adjacent land uses. Table 7.1 summarizes the anticipated types and intensity/density of land uses through the AUAR area.

Table 7.1
Moorhead GAP AUAR Project Magnitude Data

Land Use Designation	Total Net Developable Acres	Maximum Intensity of Development	Project Magnitude Data
Low Density Residential	1,025	4 units/acre	4,100 units
Low-Medium Density Residential	1,135	5 units/acre	5,685 units
Medium Density Residential	330	12 units/acre	3,960 units
High Density Residential	135	20 units/acre	2,715 units
Commercial	90	0.25 FAR	1,030,000 square feet
Office	65	0.25 FAR	414,000 square feet
Public/Institutional	190	0.15 FAR	1,900,000 square feet
Parks and Open Space	740		
Grand Total	3,710	16,460 Housing Units (5,830 attached-MF) (10,630 detached-SF) 1.45 million Sq Ft of commercial/office	

Developable land included all land except for existing road right-of-way, such as Highway 75 and 40th Ave S and lands identified as public waters or the national wetland inventory (NWI) database. The portion of the project area, previously shown in Figure 6.2, which is outside of the existing planned service boundary for sanitary sewer services is included in the project magnitude

data. The portion of the project area which is not currently in the sanitary sewer area is approximately 900 acres and would have approximately 8,000 units. The assumptions about the mixture of detached and attached housing units are summarized in Table 7.2

Table 7.2
Residential Unit Assumptions

Land Use	Percent of Housing Units Detached	Percent of Housing Units Attached
Low Density Residential	100%	0%
Low-Mid Density Residential	80%	20%
Medium Density Residential	50%	50%
High Density Residential	0%	100%

8. PERMITS AND APPROVALS REQUIRED

A listing of major approvals and public financial assistance and infrastructure likely to be required by the anticipated types of development projects should be given. This list will help orient reviewers to framework that will protect environmental resources. The list can also serve as a starting point for the development of the implementation aspects of the mitigation plan to be developed as part of the AUAR.

Table 8.1 presents a list of known local, state, and federal permits and approvals. The specific permits and approvals needed will depend on the type and magnitude of a particular development project. Additional consultation with city and agency staff will be needed to clarify whether a permit or approval is necessary.

Table 8.1
Permits and Regulatory Review/Approvals

Unit of Government	Type of Permit/review or approval	Regulatory Citation (as may be noted)
City of Moorhead	Subdivision Approval	City Code Chapter 11
	Planned Unit Development Approval	City Code Chapter 10, Article 28 and 58
	Rezoning	City Code Chapter 10, Article 3
	Flood Fringe and Floodway Overlay	City Code Chapter 10 Article 59
	Conditional Use Permit Approval	City Code Chapter 10, Article 4

Unit of Government	Type of Permit/review or approval	Regulatory Citation (as may be noted)
	Grading Permit/Drainage and Stormwater	
	Site Plan Review Approval	City Code Chapter 10, Article 15
	Comprehensive Plan Amendments	
	Zoning Ordinance Amendments	City Code Chapter 10, Article 3
	Variance	City Code Chapter 10, Article 5
Clay County	Roadway Access Permit	
	Utilities in Right-of-Way Permit	
Minnesota Department of Natural Resources	Utility Crossings Permit	MN Statute 103G, MN Rules 6115.0810
	Natural Heritage Program Coordination	Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988; MN Statutes Chapter 84.0895; MN Rules Chapter 6134
	Wetland Permit	
U.S. Army Corps of Engineers	Clean Water Act Section 404/10 Wetland Permits	Section 404 Of The Clean Water Act Title 33CFR26 - Water Pollution Prevention and Control Subchapter IV - Permits and Licenses
Minnesota Department of Health	Water Main Plan Review	MN Rules 4720
Minnesota Pollution Control Agency	NPDES Permit	MN Statute 115, MN Rules 7002
	Sanitary Sewer Extension Permit	
	401 Water Quality Certificate	
	Surface Water Discharge Permit	
	Wastewater Permit	
	Indirect Source Permit (ISP)	
Buffalo-Red River Watershed District	Grading/Drainage/Stormsewer Permit	
BNSF and OTVR Railroad	Utility Crossing License Agreement	
	Roadway Crossing License Agreement	
Minnesota State Historic Preservation Office	Cultural Resource Coordination	Section 106 of the Historic Preservation Act, Protection of Historic Properties" (36 CFR Part 800), MN Statutes 138.31-.42, MN Private

Unit of Government	Type of Permit/review or approval	Regulatory Citation (as may be noted)
		Cemeteries Act- MN Statute 307.08
Minnesota Department of Transportation	Utilities in Right-of-Way Permit	
	Access Permit	
Minnesota Environmental Quality Board (EQB)	Environmental Assessments (AUAR)	Minnesota Rules 4410

Financial assistance may be provided for qualifying projects. Assistance for housing development is primarily provided through state programs. In addition to state economic development programs, the City of Moorhead provides assistance to businesses through programs such as the Border City Development Zone and Moorhead Community Loan Program.

9. LAND USE

Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

- *Discuss past and current land use at the project's site.*
- *Generally, "proximity" means within a mile or so of the project; however, the distance can be greater in specific instances.*
- *If a site assessment for past contamination has been done, include a brief summary of the results.*
- *Discuss what is adjacent to the site (all directions).*
- *Note any nearby features of concern, including areas where vulnerable populations live or visit such as a nursing homes, schools, day care centers, water resources, parks, etc.*
- *Indicate the distance and direction to the nearest residential receptor. Since air and water contamination can potentially travel in any direction, please include all residential areas surrounding the site. You may need to contact the city or county in which the project is location for information.*

Past and current land uses in the project area have primarily been agricultural. Some farmsteads exist which generally consist of a residential structure and various outbuildings such as barns, sheds or silos. Other uses include large lot residential development on individual septic systems and private wells. In the East District there is a portion of The Meadows Golf Course, which will remain, and an existing KOA campground. The Southeast District includes Americanna Estates, a large lot residential subdivision, and a mobile home park. The Southwest District includes the Town and County Golf Course, which is municipally owned. Figure 9.1 shows existing land uses in the project area.

Adjacent land uses consist of a combination of urban and rural land uses. To the west of the East District are primarily residential neighborhoods and the remainder of The Meadows Golf Course while to the north is the City of Dilworth. There is a set of more than 10 railroad tracks which separate the project area from most of the area currently developed in Dilworth. To the east are primarily agricultural land uses and a couple of small residential neighborhood. The southern portion of the East District is bounded by Interstate 94.

The southern districts of the GAP are bounded on the north by urban land uses, including all types of residential, commercial, and industrial land use. South of the GAP is primarily agricultural in use, with a few large lot residential homes and a couple of commercial land uses. Across the Red River to the west is the City of Fargo. Since the City of Fargo has already developed further south than Moorhead, land uses across the Red River are primarily residential neighborhoods with some small commercial nodes.

The anticipated land uses within the GAP are compatible with the adjacent land uses. The mixture of residential, commercial, public/institutional and park/open space will be an expansion of the urban land uses already present in the area.

Within the project area there are no sites listed in the Minnesota Pollution Control Agency's (MPCA) Leaking Underground Storage Tank (LUST) database. There are two sites shown in Figure 9.2 immediately adjacent to the project area, though both are separated from the project area by an arterial road. The LUST file for the Camrud Foss Concrete site, located at 3300 S. 8th Street, was closed in 2000 indicating that the MPCA no longer requires any investigation or clean up of the site. The file for the High Voltage Testing Lab, located at RR4 Box 60, remains open.

The MPCA also maintains a historical database, the Master Entity System (MES), containing information on potential soil and ground water contamination sites in Minnesota. Figure 9.2 shows the Dilworth Dump, the only site from the MES that was identified within the project area. The site is classified as an "Unpermitted Dump Site." According to the resource information accompanying the MES, most of the Unpermitted Dump Sites date prior to the creation of the MPCA in 1967 and do not have detailed information. The list of Unpermitted Dump Sites includes abandoned dumps, demolition sites and tree disposal sites. Further investigation of these sites is needed to determine the risk to human health or environment and what mitigation is necessary. Rather than developing this site, the GAP indicated that the Dilworth Dump Site should be open space in the future.

10. COVER TYPES

The following information should be provided instead:
a. cover type map, at least at the scale of a USGS topographic map, depicting:
-wetlands – identified by type (Circular 39)
-watercourses – rivers, streams, creeks, ditches
-lakes – identify protected waters status and shoreland management classification
-woodlands – breakdown by classes where possible
-grassland – identify native and old field
-cropland
-current development
b. an "overlay" map showing anticipated development in relation to the cover types; this map should also depict any "protection areas," existing or proposed, that will preserve sensitive cover types. Separate maps for each major development scenario should generally be provided.

Cover Type Map

Figure 10.1 shows cover types in and around the project area. The Southwestern District includes the Red River of the North, which is classified as a Riverine by the National Wetland Inventory. Other than the Red River, all other National Wetland Inventory features are outside the project area. In close proximity to the project area are the shallow open water areas associated with the Village Green Golf Course between the project area and Interstate 94; a couple of shallow

marshes south of the 20th St S and 50th Ave S intersection; a seasonally flooded basin east of Highway 52; and a shallow marsh north of the East District in Dilworth.

Land Cover is also shown in Figure 10.1 based on the International Coalition Land Use/Land Cover dataset from the Minnesota Department of Natural Resources (MnDNR). This dataset provides land use in 1990. A visual comparison of the dataset to the 2002 Aerial Photograph from Clay County showed that the dataset is still relatively accurate except relative to the conversion of agricultural land to urban land uses. Deciduous forest remain primarily along the Red River in the Southwest District. There are small stands of trees around farmsteads, large lot residential homes and as tree breaks in some agricultural fields. Grassland is the land cover in the Southwest District along the Red River, adjacent to Highway 52 in the Southeast District, and just north of the East District along the railroad tracks.

The 100 Year Flood Plain is primarily located along the Red River and the couple of tributary streams in the project area. There is also a small area within the 100 Year Flood Plain located outside of the project area, north of the East District near the railroad tracks. The 100 Year Flood Plain is guided by the Chapter 7 Subdividing in Flood Areas of Title 11 Subdivisions of the Moorhead City Code discussed further in Question 14.

Surface water drainage in this area is generally to the north and west. Natural drainage systems are generally nonexistent in this part of Clay County. Instead, a series of man-made drainage systems were constructed. Three of these man-made ditches (numbers 9, 41, and 47) are located immediately adjacent the project area.

Figure 10.2 identifies sensitive environmental features in the project area. These features were identified from the MnDNR's electronic databases of the Minnesota County Biological Survey's (MCBS) Sites of Biodiversity Significance and Native Plant Communities, as well as the Natural Heritage Program Rare Natural Features. Both of the databases from the MCBS show a small section of wet prairie between Highway 52 and the railroad tracks just east of the project area. The MCBS classifies this area's biodiversity significance as moderate meaning that there are significant occurrences of rare species and/or moderately disturbed native plant communities. It includes areas that have a strong potential for recovery. The area is also identified by the MnDNR's Natural Heritage Program. The Natural Heritage Program also identifies two occurrences of special concern fish species in the Red River further north of the project area and two species of special plants on the northern side of Moorhead.

Overlay Map

Current land use in and around the project area was previously shown in Figure 9.1 while future land use according to the GAP was presented in Figure 6.1. An overlay map showing the 100 Year Flood Plain, cover types, and future land use according to the GAP is presented in Figure 10.3.

11. FISH, WILDLIFE, AND ECOLOGICALLY SENSITIVE RESOURCES

a. The description of wildlife and fish resources should be related to the habitat types depicted on the cover types maps (of item 10). Any differences in impacts between development scenarios should be highlighted in the discussion.
b. For an AUAR, prior consultation with the DNR Natural Heritage program for information about reports of rare plant and animal species in the vicinity is required.
If such consultation indicates the need, an on-site habitat survey for rare species in the appropriate portions of the AUAR area is required. Areas of on-site surveys should be depicted on a map, as should any "protection zones" established as a result.

Wildlife and Fish Resources

Land cover in the project area is primarily agricultural cropland with limited opportunities for wildlife habitat. Wildlife is likely to currently consist of those typical in an agricultural area such as deer, coyote, fox, rabbit, muskrat, pheasant, various birds, mice, and squirrels. The future development of the area will displace those wildlife populations. These animals will then likely inhabit the undeveloped areas to the north, south and east, as well as remain in some of the park and open space areas designed to accommodate more natural habitat.

The Red River of the North flows from west-central Minnesota north to southern Manitoba. The Red River supports a variety of fish and aquatic species, including walleye, catfish, pike, and sauger. It is currently considered impaired in the Moorhead area by federal standards because it does not meet water quality standards. Development in the project area has the potential to decrease water quality and impact aquatic habitat in the Red River if storm water is not managed adequately. The stormwater system illustrated by the GAP is intended to filter pollutants and reduce sediment loads on the Red River. The MPCA is currently studying the Red River to determine the total maximum daily load (TDML) for pollutants and strategies to reduce the loads to meet water quality standards. The City of Moorhead and other regional partners will continue to work with the MPCA in this study and implement measures to protect the Red River.

Natural Heritage Program

The Department of Natural Resources (MnDNR) Natural Heritage and Nongame Research Program (NHP) was contacted during the preparation of the AUAR. Elements of occurrence from their electronic database were previously shown in Figure 10.2. There are a total of five occurrences in the Moorhead area though all are outside of the project area. As previously mentioned in the response to Question 10, the NHP identifies a wet prairie plant community along Highway 52 east of the project area. The NHP also identifies two special concern fish species further north on the Red River and two special concern plant communities on the northern side of Moorhead.

12. PHYSICAL IMPACTS ON WATER RESOURCES

The information called for on the EAW form should be supplied for any of the infrastructure associated with the AUAR development scenarios, and for any development expected to physically impact any water resources. Where it is uncertain whether water resources will be impacted depending on the exact design of future development, the AUAR should cover the possible impacts through a "worst case scenario" or else prevent impacts through the provisions of the mitigation plan.

Development in the project area is not anticipated to involve the physical or hydrologic alteration of any existing surface waters. However, development could impact the Red River and its tributary streams if storm water runoff is not managed adequately. The MPCA has already identified portions of the Red River in the Moorhead area as impaired. Additional drainage from urban development could increase sediment and pollutant loads into the Red River. Recognizing this issue, the City of Moorhead is currently developing a Stormwater Ordinance which will address the treatment of storm water runoff, including construction techniques to minimize erosion and stabilize soils. The City has also identified a greenway corridor along the Red River in the Growth Area Plan to help prevent and reduce sediments from entering the river. The GAP identifies this open space buffer all along the western edge of the Southeast District. In addition to regional methods of addressing storm water runoff, ensuring adequate on-site storm water treatment needs will be considered as part of every development proposal. As mentioned

previously in the response to Question 11, there is currently a study being conducted by MPCA to determine the total maximum daily load (TMDL) of sediments and pollutants. Once the study has been completed, additional mitigation measure may be implemented to protect water quality.

13. WATER USE

If the area requires new water supply wells specific information about that appropriation and its potential impacts on groundwater levels should be given; if groundwater levels would be affected, any impacts resulting on other resources should be addressed.

Development within the project area will be connected to the municipal water supply. Water service is provided by Moorhead Public Service (MPS), a municipally owned utility. MPS draws the majority of the public water supply from the Red River of the North. It also has two wells in the Moorhead Aquifer, located within Moorhead, and five wells in the Buffalo Aquifer, located to the east of Moorhead. MPS has two water towers and four ground tanks.

In the last decade MPS constructed a new river water treatment plant and upgraded its river pumping station. These improvements were made as part of a long-term plan to make greater use of river water when it is available. Using more river water reserves greater amounts of water from the Buffalo and Moorhead Aquifers for use in periods of long-term drought or river contamination. An investigation into the vulnerability of the two aquifers demonstrated that that Moorhead Aquifer is not vulnerable to contamination, while vulnerability of the Buffalo Aquifer ranges from very high to low. Currently MPS is working proactively with Clay County, other communities and the Buffalo-Red River Watershed District to establish protective regulations in the Buffalo Aquifer.

Future water supply is an identified issue. Groundwater recharge of the Moorhead Aquifer is virtually non-existent and use of the aquifer since the early 1900s has drawn the volume of water down to below 100 feet. Recharge of the Buffalo Aquifer does occur, though in addition to the City of Moorhead, there are two high-capacity irrigation wells and 27 residential wells in the area. Water use is expected to increase as MPS begins to serve the City of Dilworth and development of the area continues. The increased demand from development within the project area is summarized in Table 13.1 Based on current growth projections, MPS anticipates that there will be adequate water supplies for the next 10 years. Thus, additional water supplies will be needed if the project area is to be fully built out. MPS is already in discussion with its partners to identify and protect future water sources.

Table 13.1
Projected Water Use

	Average Demand	Peak Demand
Current Demand (Million Gallons Per Day)	4.4	9.2
Estimated Per Person Demand (Gallons Per Day)	128	289
Projected GAP Population Increase	38,350	38,350

	Average Demand	Peak Demand
Estimated Future Demand in GAP (Million Gallons Per Day)	4.9	11.1
Total Demand at Build Out for City (Million Gallons Per Day)	9.3	20.3
Current Capacity of Water Treatment Plant (Million Gallons Per Day)	16	
Current Pumping Capacity (Million Gallons Per Day)	14.5	

In addition to the water supply, MPS will need to expand its infrastructure to accommodate all of the anticipated growth in the project area. The current water treatment plants have a capacity of 16 million gallons per day while MPS has the capacity of pumping 14.5 million gallons per day. As shown in Table 13.1, the projected demand for the water at total build out for the project area will be at least 20.3 million gallons per day. Thus, an expansion of the water treatment facilities and pumping stations will be needed. MPS is carefully monitoring the situation and will expand infrastructure as needed.

MPS has identified two infrastructure improvements which will need to occur to accommodate growth in the next five to ten years. In order to serve the portion of the GAP south of Interstate 94 an additional water tower and water transmission line will need to be constructed sometime after 2008. MPS currently does not anticipate needing additional infrastructure to serve development in the East District.

There are no specific water wells that are planned to be abandoned as part of this development. However, it is likely that there are some wells for existing development in the project area. All wells will be sealed and abandoned in compliance with Minnesota Department of Health regulations prior to development.

One or more temporary MnDNR Water Appropriation Permits may be necessary to conduct construction dewatering. Dewatering may be necessary during construction to install sanitary sewer, municipal water, and storm sewer in some areas. Contractors will carry out these activities on a case-by-case basis at the minimum duration and quantity necessary to construct utility service for the affected sites. The quantity and duration of construction dewatering is not known at this time, but it is expected that the dewatering will be temporary groundwater appropriated for construction dewatering purposes and will be discharged to temporary or permanent ponds located within the project area.

A temporary MnDNR Water Appropriation Permit would be required if construction dewatering and pumping from development exceeds the 10,000 gallon per day or 1,000,000 gallons per year thresholds. If it becomes apparent that construction dewatering will not exceed 50 million gallons in total, and a duration of one year from the start of pumping, the contractor or project proposer will apply to the MnDNR for coverage under MnDNR General Permit 97-005 for Temporary Water Appropriations. It is not anticipated that construction dewatering or pumping will be extensive or continue long enough to impact domestic or municipal wells.

14. WATER-RELATED LAND USE MANAGEMENT DISTRICTS

Such districts should be delineated on appropriate maps and the land use restrictions applicable in those districts should be described. If any variances or deviations from these restrictions within the AUAR area are envisioned, this should be discussed

As previously shown in Figure 10.1, the western portion of the project area along the Red River is within a 100 year flood plain. Development within this area is subject to the regulations of Chapter 7 - Subdividing in Flood Areas of Title 11 - Subdivisions of the Moorhead City Code. The City requires that any buildings for human occupation cannot be in the flood way but can be outside the flood way provided the building sites are filled to a height not more than one foot below the regulatory flood protection elevation. Commercial and industrial development at lower elevations may be allowed if it is protected with flood protection techniques. All flood protection techniques must not increase flood flows or damages. All public utilities located in the flood plain must be elevated or flood proofed. The GAP continues the City of Moorhead's efforts to establish a greenway along the Red River. As shown in Figure 10.3, most of the development in the project area should be outside of the 100 year flood plain. The Red River is not part of the Wild and Scenic Rivers program or the Critical Areas program. There are no shore land areas in the project area.

15. WATER SURFACE USE

This item need only be addressed if the AUAR area would include or adjoin recreational water bodies. If the project will change the number or type of watercraft on a water body, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

The development of the project area is not anticipated to increase the number or type of watercraft on the Red River. Development of park facilities in the Southwest District along the Red River is not anticipated to include public docks or boat launches.

16. EROSION AND SEDIMENTATION

The number of acres to be graded and number of cubic yards of soil to be moved need not be given; instead, a general discussion of the likely earthmoving needs for development of the area should be given, with an emphasis on unusual or problem areas. In discussing mitigation measures, both the standard requirements of the local ordinances and any special measures that would be added for AUAR purposes should be included.

The topography within the project area is generally flat and is not composed of highly erodible soils. However, wind erosion can be of concern depending upon the season and weather. The potential for erosion of soils exposed during development of the project area will be minimized using Best Management Practices (BMPs) during and after construction. Specific erosion control practices will be identified in final grading and construction plans for each proposed development project. Developments will be required to meet as necessary the standards of the National Pollutant Discharge Elimination System (NPDES), the City of Moorhead, and the Buffalo Red River Watershed Management District.

17. WATER QUALITY-STORMWATER RUNOFF

For an AUAR the following additional guidance should be followed in addition to that in "EAW Guidelines":
-it is expected that an AUAR will have a detailed analysis of stormwater issues;

-a map of the proposed stormwater management system and of the water bodies that will receive stormwater should be provided;
-the description of the stormwater systems would identify on-site and "regional" detention ponding and also indicate whether the various ponds will be new water bodies or converted existing ponds or wetlands. Where on-site ponds will be used but have not yet been designed, the discussion should indicate the design standards that will be followed.
-if present in or adjoining the AUAR area, the following types of water bodies must be given special analyses:
-lakes: within the Twin Cities metro area a nutrient budget analysis must be prepared for any "priority lake" identified by the Metropolitan Council. Outside of the metro area, lakes needing a nutrient budget analysis must be determined by consultation with the MPCA and DNR staffs;
-trout streams: if stormwater discharges will enter or affect a trout stream an evaluation of the impacts on the chemical composition and temperature regime of the stream and the consequent impacts on the trout population (and other species of concern) must be included;

Storm water runoff is of particular concern in the Moorhead Area due to the lack of natural drainage systems in the Lake Agassiz plain and the relatively flat topography of the area. In the project area storm water runoff is currently managed through a system of man made ditches. These artificial drainage systems and public ditches are managed by the Buffalo-Red River Watershed District. Existing runoff in the project area is fairly limited since most of the land is used for agricultural purposes.

Development in the project area is anticipated to increase storm water runoff due to the increase in impervious surfaces associated with urban land uses. Where possible, the GAP encourages storm water to be kept on the surface and treated on-site to reduce expensive storm drainage system costs. The GAP also encourages the storm water drainage system to be integrated with the open space system to create a valuable amenity for neighborhoods. The GAP illustrates how landscape corridors and parkways can meander through neighborhoods and contain storm water systems. In lower density residential areas, drainage system can recharge on-site groundwater by utilizing swales and surface systems rather than storm drains.

The storm water system illustrated in Figure 17.1 is still conceptual and will likely be adjusted as developments are proposed. The GAP illustrates enough storm water runoff capacity to handle a 100 year, 24-hour event or 5.26 inches of rain in a 24-hour period. The ultimate destination for storm water runoff will be the Red River. The storm water system was designed consistent with the engineering parameters established by the *South Moorhead Storm Water Management Plan* completed in 2004 by Houston Engineering, Inc. and incorporated as a reference in this AUAR. The purpose of the plan was to document design criteria, assumptions, and other information used in the design of Regional Storm Water Detention Facilities.

Storm water detention facilities will need to be newly created since there are no existing water bodies in the project area. Each of the stormwater detention facilities will consist of a storm water detention pond, outlet structure and miscellaneous structures. The storm water detention pond will be constructed to reduce the increased runoff rate for future development to at least or less than the historic undeveloped runoff rate. The ponds will also provide water quality storage. The ponds will also be designed to have permanent "dead storage" below their outlets for long-term treatment of pollutants. Outlet structures will be constructed at each of the detention facilities to regulate outflow. The outlet structures may be a gravity type system, lift station or combination of both.

The hydraulic design of stormwater detention ponds, outlet structures and other facilities was based on the storm water runoff calculated assuming the conversion of the existing agricultural

land to residential development. The design of ponds was based on the principles set forth in the MPCA document *Protecting Water Quality in Urban Areas – Best Management Practices for Dealing with Storm Water Runoff from Urban, Suburban and Developing Areas of Minnesota* and the requirements of the National Pollutant Discharge Elimination System (NPDES) General Storm Water Permit. Development of the storm water management system will be done in cooperation with the Buffalo-Red River Watershed District, the MPCA, and Clay County Soil and Water Conservation District.

18. WATER QUALITY-WASTEWATER

Observe the following points of guidance in an AUAR:
-only domestic wastewater should be considered in an AUAR—industrial wastewater would be coming from industrial uses that are excluded from review through an AUAR process;
-wastewater flows should be estimated by land use subareas of the AUAR area; the basis of flow estimates should be explained; -the major sewer system features should be shown on a map and the expected flows should be identified;
-if not explained under item 6, the expected staging of the sewer system construction should be described;
-the relationship of the sewer system extension to the RGU's comprehensive sewer plan and (for metro area AUARs) to Metropolitan Council regional systems plans, including MUSA expansions, should be discussed. For non-metro area AUARs, the AUAR must discuss the capacity of the RGU's wastewater treatment system compared to the flows from the AUAR area; any necessary improvements should be described;
-if on-site systems will serve part of the AUAR the guidance in "EAW Guidelines" (pages 16-17) should be followed.

The City of Moorhead is in the process of upgrading its sanitary sewer collection system based on the recommendations of the April 2002 *Evaluation Report of the East Side and South Side Sanitary Sewer Collection System* completed by Bonestroo, Rosene, Anderlik and Associates and incorporated by reference to this AUAR. This study is available through the City of Moorhead Engineering Department. The improvements include constructing a new third interceptor within the eastern part of the community, as well as modifying and extending the existing western interceptor. The City's Sanitary Sewer Collection System is shown in Figures 18.1, 18.2, and 18.3. The project was planned to provide sewer services to areas of future growth in the south and east sides of the City. Improvements were planned to accommodate the 3,150 acres previously shown in Figure 6.2. Additional improvements will need to be made to accommodate the additional development in the Southwest District outside of the current service area.

All sewage in the City of Moorhead is transported to the Wastewater Treatment Facility (WWTF). The WWTF is currently operating under its design capacity of 6 million gallons per day. However, in order for the growth areas to be completely developed, an expansion to the WWTF will be needed. Based on the City's anticipated rate of growth, expansion will not be needed for the next 15 years. No additional on-site septic systems are anticipated for the AUAR project area. Existing on-site septic systems will continue to be used until such time as municipal services are requested for the site or are immediately available.

19. GEOLOGIC HAZARDS AND SOIL CONDITIONS

A map should be included to show any groundwater hazards identified. A standard soils map for the area should be included.

The Red River Valley was once the basin of Lake Agassiz, the largest North American glacial lake. Lake Agassiz covered parts of the Minnesota, the Dakotas, and Manitoba over 9,000 years ago. As shown in Figure 19.1, soils in the project area are either part of the Fargo Association or the Bearden-Colvin Association. The Fargo Association is nearly level to gently sloping with poorly drained, silty to clayey soils. Urban development is problematic due to its wetness, frost action and shrink-swell properties. The Bearden-Colvin Association is also nearly level to gently sloping, however it is predominantly poorly drained silty soils. Development in the Bearden-Colvin Association also has limitations due to wetness, high water table, shrink-swell, and frost-heave.

The silty and clayey soils deposited on the lake bed have made the Red River Valley extremely fertile. However, the characteristics of clays have also made the banks of the Red River vulnerable to erosion and several types of slope failure, including slumping, creeping, and earthflow. As the Red River meanders the velocity of the water movement along the outside of the bank causes erosion at the base of the existing river bank. When the force of gravity is greater than the forces holding the clays together the entire bank can slump down into the river. While there are many factors influencing erosion and slope failures, it is more likely to occur when natural vegetation such as trees and grassland are removed.

Immediately south of the project area, the homes along the Red River have experienced a type of ground movement which is due to the characteristics of the underlying clays. The removal of the natural vegetation, weight of the homes and accompanying structures, and additional watering of landscaping have caused the underlying clays to flow laterally through the nearby banks of the Red River. Gravity then fills the resultant void with the overlying ground. This type of ground movement has occurred at various locations along the Red River throughout Fargo and Moorhead. Rates of ground movement are influenced by a number of factors including soil moisture conditions, water levels in the river, and the actions of people.

To best protect private and public investment, as well as ensure the City's future drinking water quality, development immediately adjacent the Red River should be limited and land should remain natural in protected park or open space areas wherever possible. Discussions with Dr. Donald Schwertz of North Dakota State University indicated that development may need to be 500 to 1,000 feet away from the Red River to minimize the potential for ground movement. Further analysis of the geologic and geotechnical setting will provide the best indication of where best to build.

20. SOLID WASTES; HAZARDOUS WASTES; STORAGE TANKS

For a, generally only the estimated total quantity of municipal solid waste generated and information about any recycling or source separation programs of the RGU need to be included. No response is necessary for b. For c, potential locations of storage tanks associated with commercial uses in the AUAR should be identified (e.g., gasoline tanks at service stations).

A) Solid Wastes

The project area will develop with residential, commercial, and public/institutional uses which will generate municipal solid waste (MSW) and recycling products. The City of Moorhead Sanitation Division provides sanitation collection and disposal services to all businesses, residences and apartment complexes. According to 2003 City of Moorhead estimates, the average household generated 0.914 tons of MSW and 0.445 tons of recycled products per year while the average employee generated 0.529 tons of MSW and 0.257 tons of recycled products per year.

These averages were used to estimate current and future waste in the City of Moorhead in Tables 20.1 and 20.2. Assumptions used in the calculations are provided after each table.

Table 20.1
Summary of Current and Future Residential Waste Generation

Waste Generate Rates[1]	2003 Number of Households[2]	Current Estimate of Waste Pear Year	Future Household Estimate[3]	Future Estimate of Waste Per Year
0.914 tons of MSW/household/year	12,196	11,145	28,660	26,195
0.445 tons of recycled product/household/year	12,196	5,425	28,660	12,755

[1]Based on 2003 City of Moorhead Data. It was estimated that 60% of all waste is from residential households.
[2]Based on 2004 City of Moorhead Housing Study.
[3]Future Household Estimate is a rounded figure including both the current household estimate of 12,196 and 16,460 additional households projected for the project area at full build-out.

Table 20.2
Summary of Current and Future Non-Residential Waste Generation

Waste Generate Rates[1]	2003 Number of Employees[2]	Current Estimate of Waste Pear Year	Future Employment Estimate[3]	Future Estimate of Waste Per Year
0.529 tons of MSW/employee/year	14,055	7,430	18,615	9,850
0.257 tons of recycled product/employee/year	14,055	3,615	18,615	4,785

[1]Based on 2003 City of Moorhead Data. It was estimated that 40% of all waste is from non-residential customers.
[2]Based on 2000 Census Estimate.
[3]Future Employment Estimate includes both current employment estimate of 14,055 and 4,560 additional employees projected for the project area at full build-out.

B) Hazardous Wastes

No response required.

C) Storage Tanks

There are no specific locations for above or below ground storage tanks known at this time. However, there is a possibility that in some of the commercial areas of the GAP a service station may need an underground storage tank for gasoline. If any business should need above or below ground storage tanks, it would need to follow MPCA and other applicable standards and procedures.

21. TRAFFIC

For most AUAR reviews a relatively detailed traffic analysis will be needed, especially if there is to be much commercial development in the AUAR area or if there are major congested roadways in the vicinity. The results of the traffic analysis must be used in the response to item 22 and to the noise aspect of item 24. Instead of responding to the information called for in item 21, the following information should be provided:
-a description and map of the existing and proposed roadway system, including state, regional, and local roads to be affected by the development of the AUAR area. This information should include existing and proposed roadway capacities and existing and projected background (i.e., without the AUAR development) traffic volumes;
—trip generation data —trip generation rates and trip totals—for teach major development scenario broken down by land use zones and/or other relevant subdivisions of the area. The projected distributions onto the roadway system must be included;
—analysis of impacts of the traffic generated by the AUAR area on the roadway system, including: comparison of peak period total flows to capacities and analysis of Levels of Service and delay times at critical points (if any);
—a discussion of structural and non-structural improvements and traffic management measures that are proposed to mitigate problems;
Note: in the above analyses the geographical scope must extend outward as far as the traffic to be generated would have a significant effect on the roadway system and traffic measurements and projections should include peak days and peak hours, or other appropriate measures related to identifying congestion problems, as well as ADTs.

This AUAR relies upon a general understanding of existing traffic patterns and volumes as outlined in the Metro COG Fargo-Moorhead Area Short and Long Range Metropolitan Transportation Plan (as incorporated by reference to this AUAR.) A proposed roadway network is illustrated in Figure 21.1. This system is based on the existing roadway network established in the Metropolitan Transportation Plan and modified based on the Growth Area Plan (as incorporated by reference.) Minor arterial roadways within the project area include Highway 75, 40th Avenue and 60th Avenue to the south, and 34th Street and 12th Avenue to the east. These roadways are typically designed or planned as 4 lane roadways with traffic management devices (signals and turn lanes) at key intersections to facilitate through movements and to maintain an acceptable and safe level of service. Local street systems will also be designed to facilitate through movements and alternative routes for traffic with local destinations. A system of parkways will provide an asset to development patterns in the growth areas and will also serve as a vehicle connection between public/civic destinations such as parks/open space areas, schools and neighborhood nodes. These parkways will have a narrow design with traffic management systems that discourage higher speeds and through traffic, but they will provide a pleasant driving environment. The Growth Area Plan provides further direction on design character for local streets.

Year 2000 average daily traffic (ADT) volumes are illustrated in Figures 21.2 and 21.3. These traffic volumes were generated by Metro COG. Future traffic volumes were developed based on the Master Plan established in the Growth Area Plan. As part of the growth area planning process, traffic volumes were generated by Metro COG (with assistance from the Advanced Traffic Analysis Center or ATAC) based on a full build out scenario. This scenario is based on development assumptions that are illustrated in Table 7.1 and described in the response to Question 7. The time frame for the full build out scenario is assumed to be 50 or more years. These resultant future volumes are illustrated in Figure 21.4 and Figure 21.5 and generally reflect an increase in 300% over 2000 ADT volumes. No peak period assessment was conducted as part

of this modeling. Traffic volumes and related impacts were assessed by City of Moorhead Engineering staff and Metro COG staff.

As development occurs in the project area, level of service analysis will need to be conducted periodically to monitor operations and to project improvement needs for 5 and 10 year capital improvement planning purposes. Transportation improvements which will be needed to accommodate full build out in the project area include:

- Extension of 50th Ave S to the east of Highway 75 as a minor arterial
- Extension of 20th St S to the south of 46th Ave S as a minor arterial
- Extension of 46th Ave S to Highway 52 as a collector
- Extension of 3rd Street S to 60th Ave S as a collector
- Extension of 28th Street S to 50th Ave S as a collector
- Extension of Westmoor Blvd to 46th Ave S as a collector
- Construction of a collector on the west side of the Southwest District between 50th Ave S and 60th Ave S
- Construction of two collectors in the Southwest District along the linear park between 50th Ave S and 60th Ave S
- Construction of 4th Ave S between 34th St S and 40th St S
- Construction of 24th Ave S between 34th St S and 44th St S
- Construction of Ridgewood Blvd between 34th St S and 44th St S
- Construction of 44th St S between 4th Ave S and 34th St S
- Construction of a parkway throughout the Southwest, South Central and Southeast Districts

Further mitigation initiatives will be outlined in the mitigation plan.

22. VEHICLE-RELATED AIR EMISSIONS

The guidance provided in "EAW Guidelines: should also be followed for an AUAR. Mitigation proposed to eliminate any potential problems may be presented under item 21 and merely referenced here. The MPCA staff should be consulted regarding possible ISP requirements for certain proposed developments; although the RGU may not want to assume responsibility for applying for an ISP for specific developments, it may be desirable to coordinate the AUAR and ISP analyses closely.

Detailed air quality modeling and testing was not conducted as part of this AUAR.

Development in the Growth Areas will result in additional traffic to internal and external roadways that will contribute additional pollutants expected from urban growth. Of concern are carbon monoxide and particulate matter under 10 microns in size. Pollutant concentrations are subject to the Environmental Protection Agency's (EPA) National Ambient Air Quality Standards (NAAQS). Monitored concentrations for pollutants subject to National Ambient Air Quality Standards (NAAQS – see 40 CFR 50) are not available based on a check of the US Environmental Protection Agency's (EPA's) online AIRS database. Concentrations in the Fargo-Moorhead Metro area are likely below comparable limits established by NAAQS. There are also no EPA or Minnesota Pollution Control Agency (MPCA) requirements for particulate matter analysis and dispersion modeling for roadway projects.

The MPCA requires carbon monoxide modeling if a project affects traffic at an identified carbon monoxide hot-spot or produces more than 77,200 vehicles per day. There were no carbon

monoxide hot-spots identified in or adjacent to the project area, and traffic generated by development in the growth area will not approach the threshold for any one project, however, it is anticipated that upon complete build out of the growth area (anticipated to be 50 or more years) traffic generation from the project area on a daily basis may exceed the threshold. The build out traffic forecasts for the identified intersections in the project area show that levels are well below what would be needed to require modeling. Roadway construction within the project area will likely not receive federal funding, is not subject to federal Transportation Conformity rules, and therefore, does not require any analysis pursuant to these rules.

The development pattern assumed for the project area is not unlike development patterns occurring in other areas of the Fargo-Moorhead metro area and is anticipated to take place over an extended period of time (50 years or more). Mitigation measures to reduce or minimize the amount of air pollutants generated by development related traffic will be identified in the Mitigation Plan. It is recommended that projects of a magnitude that would trigger a mandatory EAW conduct more detailed air quality testing to ensure consistency with NAAQS.

23. STATIONARY SOURCE AIR EMISSIONS

This item is not applicable to an AUAR. Any stationary air emissions source large enough to merit environmental review requires individual review.

No response required.

24. DUST, ODORS, NOISE

Dust, odors, and construction noise need not be addressed in an AUAR, unless there is some unusual reason to do so. The RGU might want to discuss as part of the mitigation plan, however, any dust control or construction noise ordinances in effect. If the area will include or adjoin major noise sources a noise analysis is needed to determine if any noise levels in excess of standards would occur, and if so, to identify appropriate mitigation measures. With respect to traffic-generated noise, the noise analysis should be based on the traffic analysis of item 21.

Development in the project area is not anticipated to generate any unusual dust, odors or noise that is inconsistent with MPCA standards. Dust and noise may be associated with demolition, grading of the site, and construction of roadways, buildings, driveways, and parking areas. Noise may also be associated with mechanical equipment as well as traffic accessing the site.

No noise modeling or testing was completed as part of this AUAR. It is anticipated that future traffic noise levels will likely exceed MPCA's maximum allowable levels for the residential areas adjacent to major collector and arterial roadways where speeds approach or exceed 40 mph. The City of Moorhead has the obligation to ensure that daytime and nighttime noise levels are below the MPCA thresholds. Future development patterns occurring adjacent to major road will need to provide design mechanisms such as berming, landscaping or fencing to attenuate noise levels. As properties develop, specific noise analysis may be needed during subdivision design to better address noise conditions. Policies established in the Comprehensive Plan and the design character described in the Growth Area Plan are in place to ensure design mechanisms to mitigate potential noise pollution.

25. SENSITIVE RESOURCES

Archeological, historic, and architectural resources. For an AUAR, contact with the State Historic Preservation Office is required to determine whether there are areas of potential impacts to these resources. If any exist, an appropriate site survey of high probability areas is

needed to address the issue in more detail. The mitigation plan must include mitigation for any impacts identified. Prime or unique farmlands. The extent of conversion of existing farmlands anticipated in the AUAR should be described. If any farmland will be preserved by special protection programs, this should be discussed. Designated parks, recreation areas, or trails. If development of the AUAR will interfere or change the use of any existing such resource, this should be described in the AUAR. The RGU may also want to discuss under this item any proposed parks, recreation areas, or trails to be developed in conjunction with development of the AUAR area.
Scenic views and vistas. Any impacts on such resources present in the AUAR should be addressed. This would include both direct physical impacts and impacts on visual quality or integrity. "EAW Guidelines: contains a list of possible scenic resources (page 20).

Archeological, historic and architectural resources

Throughout history waterways, such as the Red River, have been an important location for human settlement. Archaeological artifacts have been found near the banks of the Red River in various parts of the Fargo-Moorhead area. Discussions with the Clay County Historical Society and Dr. Michlovic, the Chair of Anthropology and Earth Sciences Department at Minnesota State University-Moorhead, indicate that there has not been a systematic survey in the Moorhead area. Since the Red River has meandered throughout its history, the potential for archaeological sites exist within about an eighth to a quarter mile of the river, as shown on Figure 25.1.

In the mid-1800s the Red River Valley was an important part of the travel route linking St. Paul to Winnipeg. Navigating on the Red River typically began a little north of present day Georgetown, which is north of Moorhead. To reach Georgetown travelers used one of many oxcart paths that wound through western Minnesota. One of these routes followed the Red River bank south through Moorhead towards Breckenridge. This Red River trail has been identified by the Minnesota State Historic Preservation Office (SHPO) to be in the project area. SHPO records indicate that the Red River Trail is generally located in the western half of sections 20, 29, and 32 of Township 139, Range 48, shown on Figure 25.1. Additional information on the Red River Trails can be found in *The Red River Trails: Oxcart Routes Between St. Paul and the Selkirk Settlement 1820-1870* by Rhonda R. Gilman, Carolyn Gilman, and Deborah M. Stultz. Further investigation would be needed to determine whether the Red River Trail remains in the project area. It is likely that due to modern roads, like Highway 75, and plowing of agricultural fields, little remains of the trail through the project area.

There are no currently listed National Register Historic Properties in the study area. There are two architectural features identified by SHPO within a mile of the project area. In the City of Dilworth the Northern Pacific Buildings on 3rd St NE and 2nd Ave SE have been inventoried. The other structure identified was the south dam of the Red River. The south dam is located across the Red River at mile marker 458.1. Development in the growth area will not likely impact either of these sites.

To best protect potential archaeological, historic and architectural resources within the project area, a survey by a qualified archaeologist or historian should be completed. Consultation with SHPO only identified recorded archaeological sites and historic architectural properties. However, since the majority of archaeological sites and many historic architectural properties have not been recorded, important sites or structures may exist and be affected by development in the project area.

A survey of the area may be needed depending on the source of funding for public improvements within the project area. Federal funding or permitting generally requires a Section 106 review while state funding requires compliance with the Minnesota Field Archaeology Act, Minnesota Historic Sites Act, and Minnesota Private Cemeteries Act. Consultation with SHPO and the State Archaeologist will ensure compliance when federal or state funding is used.

Prime or unique farmland

It is not anticipated that existing farmlands will be protected through special programs, deed restrictions, conservation easements or other means. As anticipated in both the City's and County's Comprehensive Plans, it is expected that the project area will be fully developed.

Designated parks, recreation areas or trails

The only designated parks, recreation areas or trails currently within the project area are Town and County Golf Course in the Southwest District and a portion of Meadows Golf Course in the East District. Meadows Golf Course will remain as it is into the future. The future for the municipally owned Town and County Golf Course has not been determined at this time.

The Growth Area Plan was developed recognizing the value of parks, open spaces and trails to the community. Almost 20% of the land in the project area has been designated for parks, open spaces and stormwater ponding. This percentage does not include future land to be dedicated for neighborhood parks and tot lots whose location has only been generally identified. The GAP envisions a system of large open spaces, community and neighborhood parks, plazas and parkways. It recommends that the park and open space system should be well integrated into the street system and a comprehensive system of bike and walking paths should link areas together. The park and open space system is also designed to incorporate the needed stormwater ponds as an amenity and natural feature.

The City of Moorhead will need to complete additional planning for the regional parks and open spaces. The regional parks are intended to include a variety of active and passive recreational uses. Further exploration of the long-term vegetation of the open spaces is needed. One area of particular importance is along the Red River. Preserving the existing vegetation will not only help with minimizing erosion of the banks, but also minimize ongoing maintenance costs.

Scenic view and vistas

Natural areas are an important part of Moorhead's Vision. The Red River is the most visible part of the natural environment in the project area. Preservation of scenic views and vistas will be accomplished through the creation of park and open space areas in the Southwest District along the Red River.

26. ADVERSE VISUAL IMPACTS

If any non-routine visual impacts would occur from the anticipated development, this should be discussed here along with appropriate mitigation.

The AUAR anticipates a development pattern similar to those uses in the surrounding area and does not anticipate any adverse visual impacts as a result of the development scenario.

27. COMPATIBILITY WITH PLANS

The AUAR must include a statement of certification from the RGU that its comprehensive plan complies with the requirements set out at 4410.3610, subpart 1. The AUAR document should

discuss the proposed AUAR area development in the context of the comprehensive plan. If this has not been done as part of the responses to items 6,9,18,21, and others, it must be addressed here; a brief synopsis should be presented here if the material has been presented in detail under other items. Necessary amendments to comprehensive plan elements to allow for any of the development scenarios should be noted. If there are any management plans of any other local, state, or federal agencies applicable to the AUAR area, the document must discuss the compatibility of the plan with the various development scenarios studied, with emphasis on any incompatible elements.

The City of Moorhead adopted its most recent Comprehensive Plan in 2004. This Comprehensive Plan, in concert with the City's public facilities plans and capital improvement program, complies with the requirements set out in 4410.3610, subpart 1.

The 2004 Comprehensive Plan identified the project area as emerging neighborhoods. One of the initiatives identified by the Comprehensive Plan was that Growth Area Plans be developed for emerging areas. These Growth Area Plans would include connected street networks, regionalized stormwater infrastructure, connected park and open space systems, and detailed land use plans. While there were a number of emerging neighborhoods, the City of Moorhead began growth area planning by concentrating on the south and east sides of Moorhead.

As shown in Figure 27.1, most of the project area was guided Moderate Density Mixed Residential in the City's Comprehensive Plan. Moderate Density Mixed Residential land use was intended to have a mixture of single-family and multi-family housing types with an average density of 5 units per acre. The neighborhoods should have a mixture of attached and detached structures, though none more than 3 stories.

The GAP provides a more detailed land use pattern to illustrate how a larger area with multiple property owners develops into the Moderate Density Mixed Residential Land Use Pattern identified by the Comprehensive Plan. The Growth Area Plan not only meets the overall gross density average of 5 units an acre but also generally achieves the 5 unit per acre target for each of the four sub-districts.

The GAP does vary from the Comprehensive Plan in the location of non-residential development so future modifications may be needed as developments are proposed. While the GAP may not follow the exact locations of non-residential development, it does implement the vision of the Comprehensive Plan. For example, the Comprehensive Plan identified the importance of Neighborhood Commercial Nodes throughout the community to provide convenience retail and services to area residents. The GAP followed the Comprehensive Plan guidance in locating a number of nodes throughout the project area on one or more sides of major intersections.

The Comprehensive Plan also did not identify specific sites for future public and institutional uses. However, the Comprehensive Plan did support the development of public and institutional facilities within neighborhoods as long as they are placed appropriately and designed to minimize negative impacts. Based on conversations with property owners and developers the GAP was able to identify specific, appropriate sites for public and institutional facilities.

The GAP went beyond the detail of the Comprehensive Plan in identifying specific locations of future parks and open space. The policies of the Comprehensive Plan were implemented in the development of the GAP by locating parks as central parts of neighborhoods, creating a system linking parks and major activity areas of the community, and using infrastructure features such as ditches and stormwater ponds as natural amenities.

Currently a portion of the project area is outside of the City of Moorhead's municipal boundary. While there is not an annexation agreement between the City of Moorhead and Moorhead Township, there is a good working relationship between the two governmental entities. The City of Moorhead annexes those lands mostly likely to develop so as to ensure the efficient use of public infrastructure.

Clay County's Comprehensive Plan was adopted in 2002. Figure 27.2 shows the portion of Clay County's Land Use Plan near Moorhead. The Comprehensive Plan identifies planned growth areas around existing communities such as Moorhead. Planned growth areas lie outside of existing urban areas and are most likely to be developed in the future. Long-term land use planning in these areas is generally left to the community's Comprehensive Plan. Coordination with communities is recommended to ensure development follows planned growth patterns and infrastructure improvements. In the short-term development and land uses in advance of annexation should be limited so as to protect the areas for future urbanization.

Transportation planning is done in conjunction with the Fargo-Moorhead Council of Governments (Metro COG), the primary transportation planning agency for the metropolitan area. Transportation planning not only includes roadway networks, but also transit and bicycle routes. Consultation with Metro COG was part of the development of the GAP. The GAP identifies a network of arterials, collectors and parkways which are compatible with existing plans. The GAP also illustrated a proposed bikeway system which is compatible with the Metro COG's *Metropolitan Bicycle and Pedestrian Plan*.

28. IMPACT ON INFRASTRUCTURE AND PUBLIC SERVICES

This item should first of all summarize information on physical infrastructure presented under items (such 6, 17, 18 and 21). Other major infrastructure or public services not covered under other items should be discussed as well — this includes major social services such as schools, police, fire, etc. The RGU must be careful to include project-associated infrastructure as an explicit part of the AUAR review if it is to exempt from project-specific review in the future.

Water

Infrastructure improvements are anticipated to be needed in the next five to ten years. Moorhead Public Service (MPS) anticipates it will be able to meet the needs of growth in the East District without infrastructure improvements. South of Interstate 94 there will be a need for a new water tower and a new transmission line as development continues. Additional water supplies are not anticipated to be needed in the next decade depending on water demand. MPS is already working other communities and regional partners to identify and protect potential water sources.

Sewer

The City of Moorhead initiated a Sanitary Sewer Interceptor project in 2003 because the east side system was at or nearing capacity. The expansion involves the construction of a new third interceptor within the eastern part of the City as well as modifying and extending the existing western interceptor. The expansion of the sanitary sewer should accommodate the development of about 3,150 acres. As identified in Question 18, additional expansion of the sanitary sewer system will be needed in the long-term to accommodate the portion of development south of 50th Ave S in the Southwest District.

Electricity

In order to serve the future needs of the community, MPS has identified a need for a 115 kilovolt(kv) transmission line south of Interstate 94 and a substation along 20th Street S. To accommodate this need, the GAP illustrated the new transmission line as part of a green space corridor between 50th Ave S and 60th Ave S within the project area. The new transmission line would be located next to an existing 230 kv transmission line owned by Ottertail Power Company. Co-locating these two transmission lines would minimize the visual and physical impacts of the lines. The GAP recommended the transmission line continue east until 50th Street S, when it would turn north. While an exact location has not been determined, the new substation could be accommodated within the park and open space areas identified to the east side of 20th Street S and the railroad tracks.

Storm Water Management

Storm water runoff is anticipated to increase as development occurs in the growth area and a system of regional detention facilities will be needed. The GAP illustrated a conceptual storm water system with enough storm water runoff capacity to handle a 100 year, 24-hour event or 5.26 inches of rain in a 24-hour period. The City of Moorhead will work with property owners and developers to construct and manage the storm water system.

Transportation

The City of Moorhead coordinates with Clay County, Fargo-Moorhead Council of Government (Metro COG), and the Minnesota Department of Transportation on transportation initiatives. The City and Metro COG maintain a long range transportation planning system that is poised to handle the increased traffic demands generated by new growth. The proposed roadway network includes a system of arterials, collectors, local roads and parkways to facilitate traffic movement. Over 10 arterials, collectors or parkways have already been identified as needing extension or construction to achieve full build-out of the GAP. As development occurs in the project area, level of service analysis will need to be conducted periodically to monitor operations and to project improvement needs for 5 and 10 year capital improvement planning purposes.

Transit

Moorhead Metropolitan Area Transit currently provides six regular and two special limited fixed routes to portions of the project area. Two of those routes have stops along the edges of the project area. Transit services will need to be expanded as the project area develops. The City of Moorhead will work with Metro COG to plan for future route expansions to serve the Growth Areas of South and East Moorhead. The development pattern established in the GAP concentrates higher density, mixed use development patterns in nodes near major roadway corridors that can be more efficiently served by public transit. This development pattern is referred to as transit oriented development or TOD.

Police and Fire Services

Additional community facilities will be needed to house expand police and fire protection services. The City of Moorhead anticipates that a community facility will be needed south of Interstate 94 in the next five to ten years. The GAP identified a potential location for this facility in the South Central District along 46th Ave S. An additional facility for police and fire services may also be needed in the East District but not for more than a decade.

School District

In 2004 Moorhead School District opened the new Reinertson Elementary School in the South Central District and Horizon Middle School in the East District. These new schools have already been a catalyst for new growth in the south and east areas of the community. As the community grows the City and School District anticipate needing at least one more new elementary school. While exact sites have not been determined the Growth Area Plan identifies a few potential sites to accommodate the need for one or more additional school facilities. While the next school facility may or may not be built within the project area, the identification of potential sites allows the GAP to incorporate needed infrastructure and make connections to the park and open space system for potential future sites.

Telephone and Cable

As with other infrastructure, telephone and cable infrastructure will need to be expanded as development occurs in the project area. Planning for growth is generally based on plans submitted and discussions with City staff. In general, the infrastructure needed to provide telephone and cable services can be placed into the right-of-way. There is also a need for small structures and boxes which are usually placed within easements. Discussions with company representatives will ensure that they are aware of the GAP, there is sufficient room in the right-of-way for infrastructure, and plans for other needed structures are made.

29. CUMULATIVE IMPACTS

This item does not require a response for an AUAR with respect to cumulative impacts of potential developments within the AUAR boundaries, since the entire AUAR process is intended to deal with cumulative impacts from related developments within the AUAR area; it is presumed that the responses to all items on the EAW form encompass the impacts from all anticipated developments within the AUAR area. However, the questions of this item should be answered with respect to the cumulative impacts of development within the AUAR boundaries combined with past, present, and reasonably foreseeable future projects outside of the AUAR area, where such cumulative impacts may be potentially significant. (As stated on the EAW form, these cumulative impact descriptions may be provided as part of the responses to other appropriate EAW items, or in response to this item).

No response required.

30. OTHER POTENTIAL ENVIRONMENTAL IMPACTS

If applicable, this item should be answered as requested by the EAW form.

The development scenario described in Question 6 will not generate any environmental impacts beyond those described in this AUAR.

31. SUMMARY OF ISSUES

The RGU may answer this question as asked by the form, or instead may choose to provide an Executive Summary to the document that basically covers the same information. Either way, the major emphasis should be on: potentially significant impacts, the differences in impacts between major development scenarios, and the proposed mitigation.

See the Executive Summary.

Mitigation Initiatives

Mitigation Plan. *The final AUAR document must include an explicit mitigation plan. At the RGU's option, a draft plan may be included in the draft AUAR document; of course, whether or not there is a separate item for a draft mitigation plan, proposed mitigation must be addressed throughout the document.*

It must be understood that the mitigation plan in the final document takes on the nature of a commitment by the RGU to prevent potentially significant impacts from occurring from specific projects. It is more than just a list a ways to reduce impacts – it must include information about how the mitigation will be applied and assurances that it will. Otherwise, the AUAR may not be adequate, and/or specific projects may lose their exemption from individual review. The RGU's final action on the AUAR must specifically adopt the mitigation plan; therefore, the plan has a "political" as well as technical dimension.

This Mitigation Plan identifies initiatives that address potential impacts resulting from future development within the AUAR project area. This mitigation plan specifies the controls, procedures, and other steps that may be implemented to protect or minimize potential negative impacts. In order to mitigate the potential environmental impacts identified in the Growth Area for South and East Moorhead AUAR, the City of Moorhead will commit to implementing the mitigation initiatives identified in this plan.

INTENT OF MITIGATION PLAN

The development of the AUAR project area could have impacts on the environment and existing development. This plan identifies existing tools and policies that the City of Moorhead has in place, as well as additional initiatives that will need to be implemented to mitigate potential impacts. There are multiple ways in which Mitigation Initiatives may be implemented such as:

- Enforcing existing zoning and subdivision ordinances and other development regulations at the time of development concept submittals, preliminary and final platting, and during construction monitoring activities
- Referencing and implementing policy directions provided in the Comprehensive Plan and the Growth Area Plan during the review and approvals of development projects
- Facilitating additional study as regional transportation planning initiatives become more finalized or as other regional developments alter travel patterns/behaviors
- Planning and building public infrastructure (local roads, parks, trunk sewer and water systems) in conjunction with private development initiatives
- Maintaining and updating existing plans and studies for the community
- Requiring additional field work/investigation as part of pre-development planning where potential environmental or cultural resources may exist but have not been verified or where more detailed air quality testing or noise monitoring may be needed.

GENERAL MITIGATION INITIATIVES

This section identifies a series of mitigation initiatives that are general in nature and apply to all public and private development within the AUAR.

1. All permits identified in the AUAR (see Question 8), as well as other necessary permits that may be required will be secured by private parties, or the City as appropriate, for all development activities within the project area.

2. The City will follow its own regulations, ordinances, plans, and policies currently in place in the review and approval of all development activities within the project area. These items include the *Comprehensive Plan*, the *Growth Area Plan*, and the official *zoning* and *subdivision ordinances*. In addition, the *South Moorhead Storm Water Management Plan* and the *Evaluation Report for East Side and South Side Sanitary Sewer Collection System* will be used as technical resources in reviewing development activities and developing associated public infrastructure.

3. The City will provide for adequate regional and local stormwater ponds and trunk facilities so as to protect water resources and water quality as guided by the *South Moorhead Storm Water Management Plan*.

4. The City will extend public sewer and water services in a manner consistent with existing plans and policies. The City will monitor capacities, update plans, and extend services as necessary to ensure sufficient supply and quality of services.

5. The City will implement a development tracking mechanism to monitor development within the AUAR project area and its conformance with the development scenario using Geographic Information System (GIS) Software and mapping.

6. The City will enforce its parkland dedication policies consistent with the goals and policies of the Comprehensive Plan and Growth Area Plan, as well as the requirements of the subdivision ordinance.

7. The City will work with Clay County and the Fargo-Moorhead Metropolitan Council of Governments to monitor traffic and regional development initiatives that may impact the project area to ensure sufficient transportation level of services.

FOCUSED MITIGATION INITIATIVES

Mitigation initiatives that are explicitly intended to mitigate or minimize impacts on a particular resource or action are outlined by topic in this section.

Natural and Physical Resources

The most significant natural feature in the project area is the Red River. In order to minimize the potential for ground movement development should not be allowed on the banks of the Red River. Developments should also maintain the natural vegetation to help stabilize the river banks. To best protect private and public investment, as well as ensure the City's future drinking water quality, development immediately adjacent the Red River should be limited and land should remain natural in protected park or open space areas wherever possible. Further analysis of the geologic and geotechnical setting prior to construction will provide the best indication of where best to build.

Cultural Resources

There is the potential for archaeological, historic, and/or architectural resources in the project area. The strongest potential for cultural resources is within an eighth to a quarter mile of the Red River and along the likely route of the Red River Trail. To best protect these resources, a survey by a qualified archeologist or historian will be considered for the project area prior to new development. Additional surveys needed as part of public improvements will be done in consultation with SHPO and the State Archaeologist to comply with federal and state regulations.

Land Use Management

The AUAR identified the existence of an old dump in the project area near 8th Avenue South and 34th Street S. Rather than disturbing the site, the Growth Area Plan recommends that the site remain as an open space area. The dump should be preserved as a passive open space. If development were proposed to occur on the former dump site, additional environmental investigation of a technical nature would be required to assess the impacts of developing the site. The City will maintain consistency with the Comprehensive Plan and the Growth Area Plan. However, should a development project require an amendment, the project should be evaluated based on its consistency with the City's overall Vision and Guiding Principles as outlined in the Comprehensive Plan and should be considered if it meets the general intent. If the magnitude of the project is substantially greater than what was estimated in the AUAR, an update to the AUAR would be necessary as provided for under Minnesota Rules 4410.3610 Subp. 7.

Erosion Control and Sedimentation

There is a potential for wind erosion during construction of the project area. Soil erosion will be minimized using best management practices (BMPs) outlined in various resources such as by the Minnesota Pollution Control Agency (MPCA) and practiced by the City Engineering Department while permitting development projects.

Water Supply and Appropriation

Existing water mains are in place and available for development. The City of Moorhead and Moorehead Public Service will be monitoring the water system to determine when an additional water transmission line and a new water tower are needed for the portion of the project area south of Interstate 94. MPS will continue to update its capital budget to plan accordingly for these investments. The City of Moorhead will also continue to work with regional partners to identify and protect current and future water supplies that may fall outside of the City's corporate boundaries.

Each development will be responsible for the following:

- Minnesota Department of Health permit(s) for the extension of water supply systems
- Water Access Charges (WAC) related to their development
- Proportional share of the cots for the Trunk Water Supply lines
- Construction of local water supply lines

Wastewater System

The City of Moorhead will complete the improvements underway to ensure development. Through its site development plan review process, the City of Moorhead will monitor and verify estimated wastewater flows for general conformance to the *Evaluation Report for East Side and South Side Sanitary Sewer Collection System*. In addition each development will be responsible for the following:

- Sewer Access Charges (SAC) related to their proposed development
- Proportional share of the costs of the Trunk Sanitary Sewer Main
- Construction of local sewer mains to serve the development

Storm Water Management

Development within the project area will increase the amount of storm water runoff. The City will ensure the development of a storm water management system which limits flooding and negative impacts on water quality in the Red River. Key strategies will include:

- Maintaining discharge rates at or below current levels
- Pre-treatment of runoff prior to discharge into the Red River
- Adoption and enforcement of a Storm Water Ordinance
- Cooperation with MPCA and other partners in development and implementation of strategies to meet the Total Maximum Daily Load (TDML) standard yet to be determined
- Design ponds based on principles of MPCA's *Protecting Water Quality in Urban Areas – Best Management Practices for Dealing with Storm Water Runoff from Urban, Suburban and Developing Areas of Minnesota*
- Conformance to National Urban Runoff Pond (NURP) standards
- Conformance to National Pollution Discharge Elimination System (NPDES) Phase II requirements as outlined in the EPA Clean Water Act.

Developments within the AUAR project area which impact wetlands will be subject to regulation under the Wetland Conservation Act, Chapter 103G Waters of the State (i.e. Department of Natural Resources), and possibly Section 404 of the Clean Water Act (i.e. Army Corps of Engineers). The City of Moorhead will work with the Clay County Soil and Water Conservation District, the local government unit responsible for administering the MN Wetlands Conservation Act, on any development impacting wetlands. Should wetland impacts be part of a development within the project area, these regulatory programs have sequencing requirements which require applicants to demonstrate that wetlands impacts have been avoided and minimized to the extent practical and, if impacts cannot be avoided, these program require replacement of wetlands impacted by fill or excavation.

Traffic

Increased traffic generation in the project area will require construction of new roads to serve the development and improvements to existing roadways and intersections to accommodate growing traffic volumes. The City identifies projects through its 5 and 10 year capital improvement program and will continue to plan and budget for necessary roadway improvements associated with new development in the growth areas. Specific traffic mitigation measures will include the following:

- Update and maintain the 5 and 10 year Capital Improvement Plan (CIP)
- Begin conversations with MnDOT regarding long term planning and improvement needs at the Highway 75/8th Street and I-94 interchange
- Continue close collaboration with Metro COG to monitor traffic volumes and update projections to inform the CIP
- Incorporate design strategies such as berming, landscaping, or increased setbacks along new major roadways that mitigate noise impacts
- Work with Moorhead Metropolitan Area Transit to plan for new route alignments to serve future development in the Growth Area when demand is sufficient to support bus service
- Encourage development projects to design with consideration given to transit services including incorporation of future bus stops, development of sidewalk and trail connections, and other site design features

MONITORING OF DEVELOPMENT AND FUTURE UPDATES TO THE AUAR

The AUAR assumes a hypothetical development scenario. Since it is based on assumptions it is important that actual development be monitored and compared to the development that was assumed in the development of the AUAR. Tracking of this development will be done through the City's existing GIS system. As part of the final plat process the developer will submit electronic plats consistent with city development requirements in a compatible form to the City's GIS system. This data will enable to the City to maintain an ongoing inventory of platted lots and the ability to tie building permits to the lots so that occupied housing units could be tracked in the development area. The City's existing GIS system has the capacity to perform this task.

As required by Minnesota Rule 4410.3610 Subpart 7, to remain valid, the AUAR must be updated if any of the following events should occur:

- Five years have passed since the AUAR and mitigation plan were adopted and all development within the project area has not been given final approval.
- A comprehensive plan amendment is proposed that would allow an increase in development than what was assumed in the development scenario.
- Total development within the area would exceed the maximum levels assumed in the environmental analysis document.
- Development within any subarea delineated in the AUAR would exceed the maximum levels assumed for that subarea in the document.
- A substantial change is proposed in public facilities intended to service development in the area that may result in increased adverse impacts on the environment.
- Development or construction of public facilities will occur differently than assumed in the development scenario such that it will postpone or alter mitigation plans or increase the development magnitude.
- New information demonstrates that important assumptions or background conditions used in the analysis presented in the AUAR are substantially in error and that environmental impacts have consequently been substantially underestimated.
- The RGU determines that other substantial changes have occurred that may affect the potential for, or magnitude of, adverse environmental impacts.

AUAR
Figures

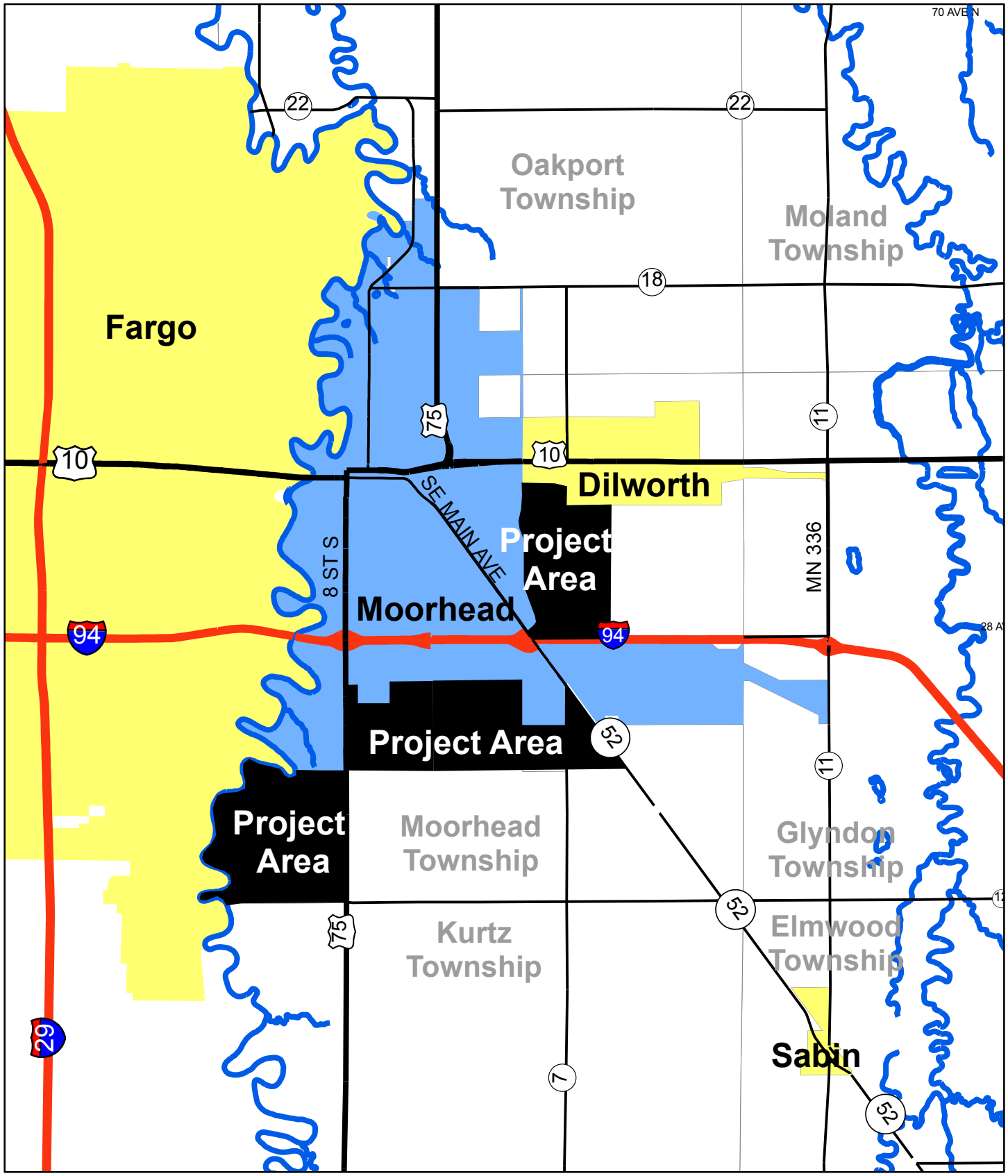

Figure 5.1 - Project Location

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: Mn/DOT, Clay County, Cass County and City of Moorhead

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

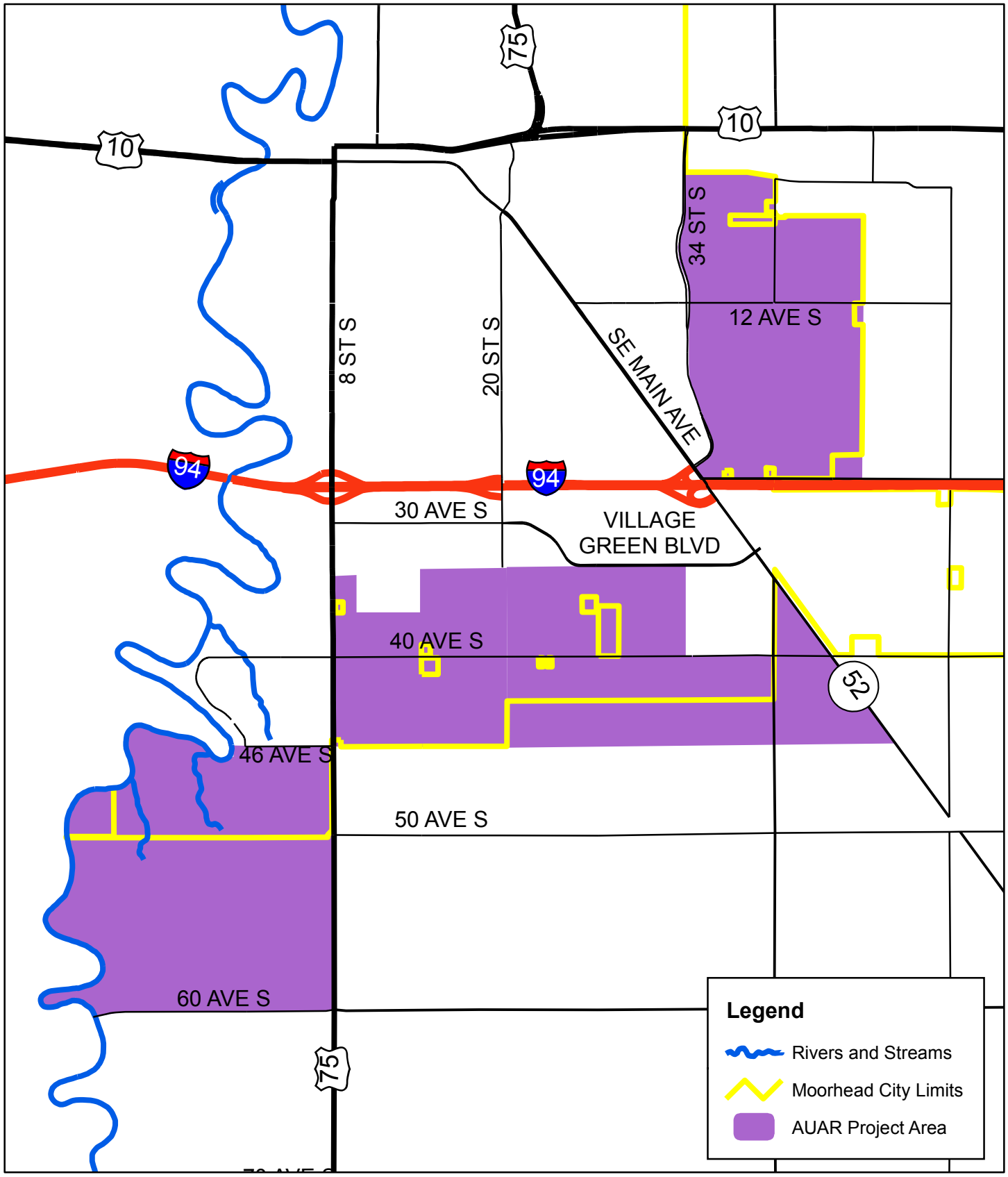

Figure 5.2 - AUAR Boundary

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDOT, Clay County, Cass County and City of Moorhead

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

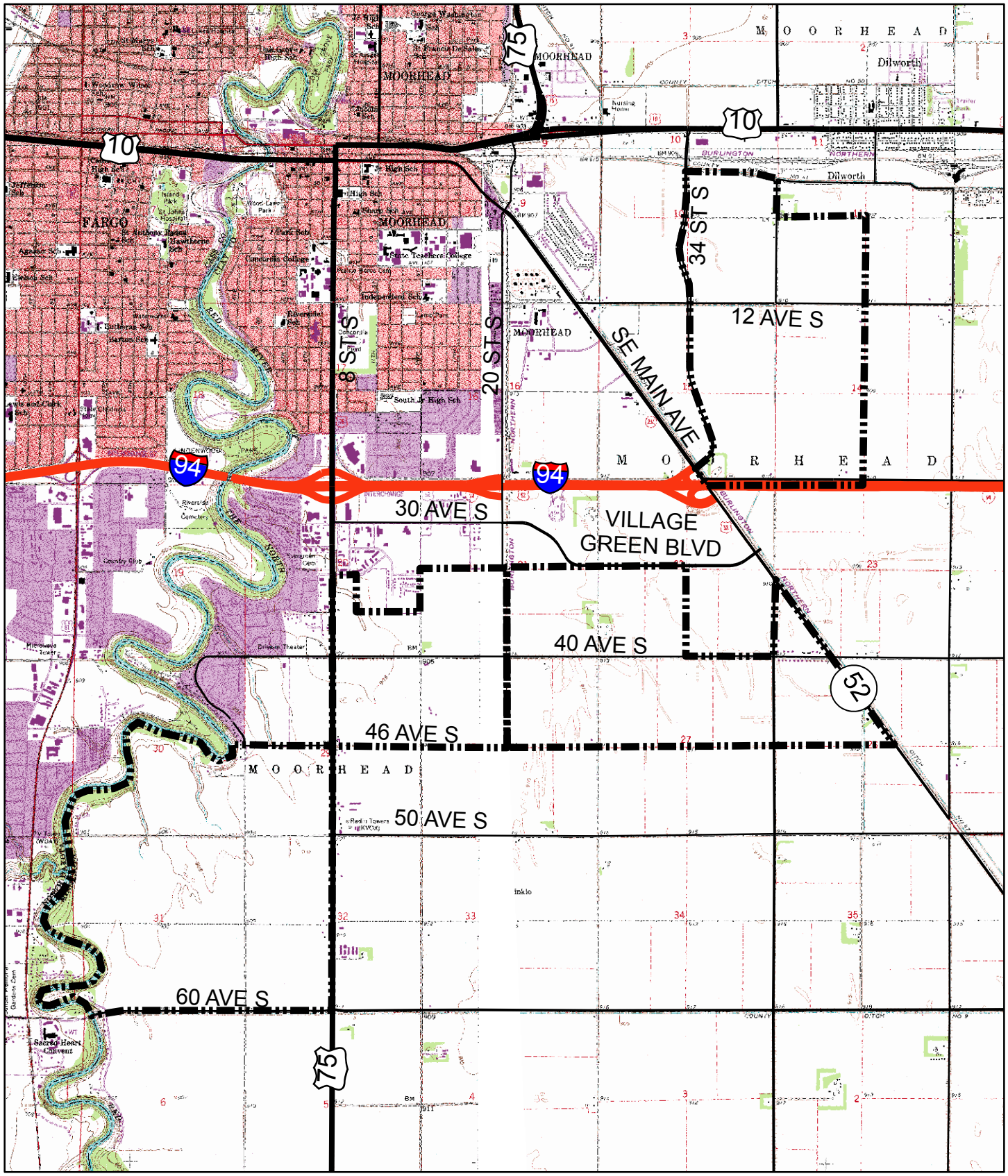

Figure 5.3 - USGS Map

January 2005

Growth Area for South and East Moorhead Alternative Urban Areawide Review

Source: MnDNR, MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

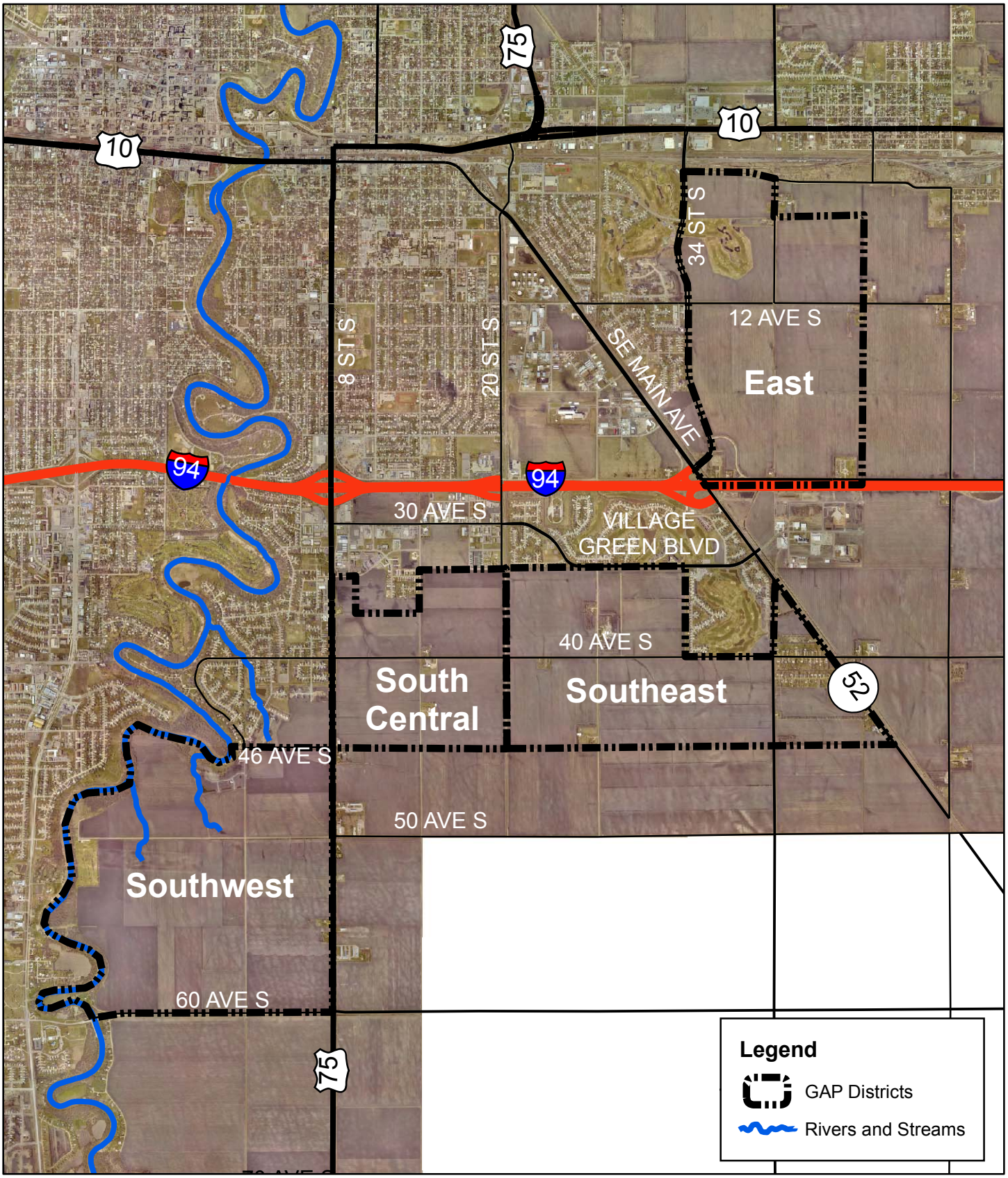

Figure 5.4 - Growth Area Plan (GAP) Districts

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

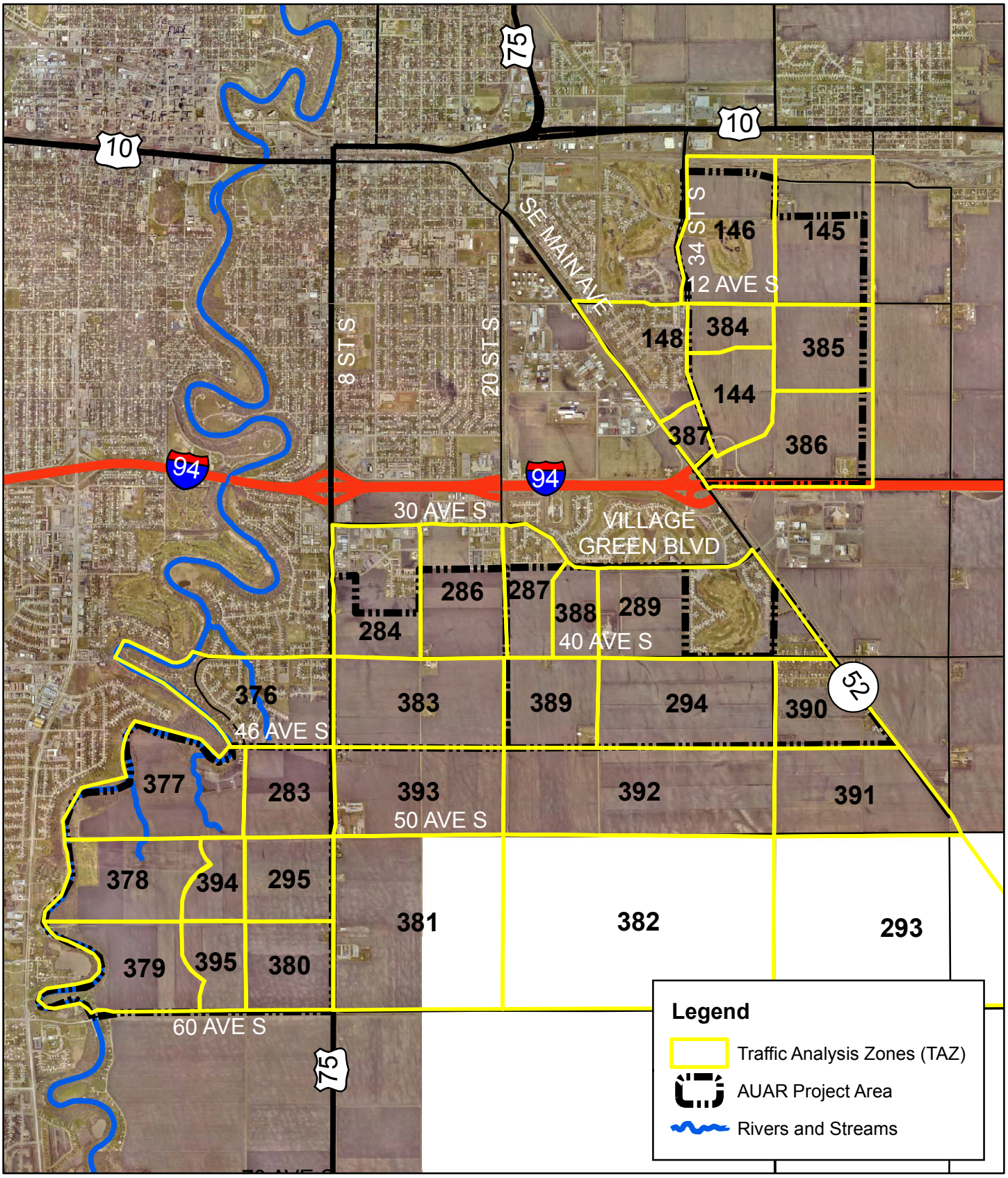

Figure 5.5 - Traffic Analysis Zones (TAZ)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDOT, Fargo-Moorhead Metropolitan Council of Governments, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

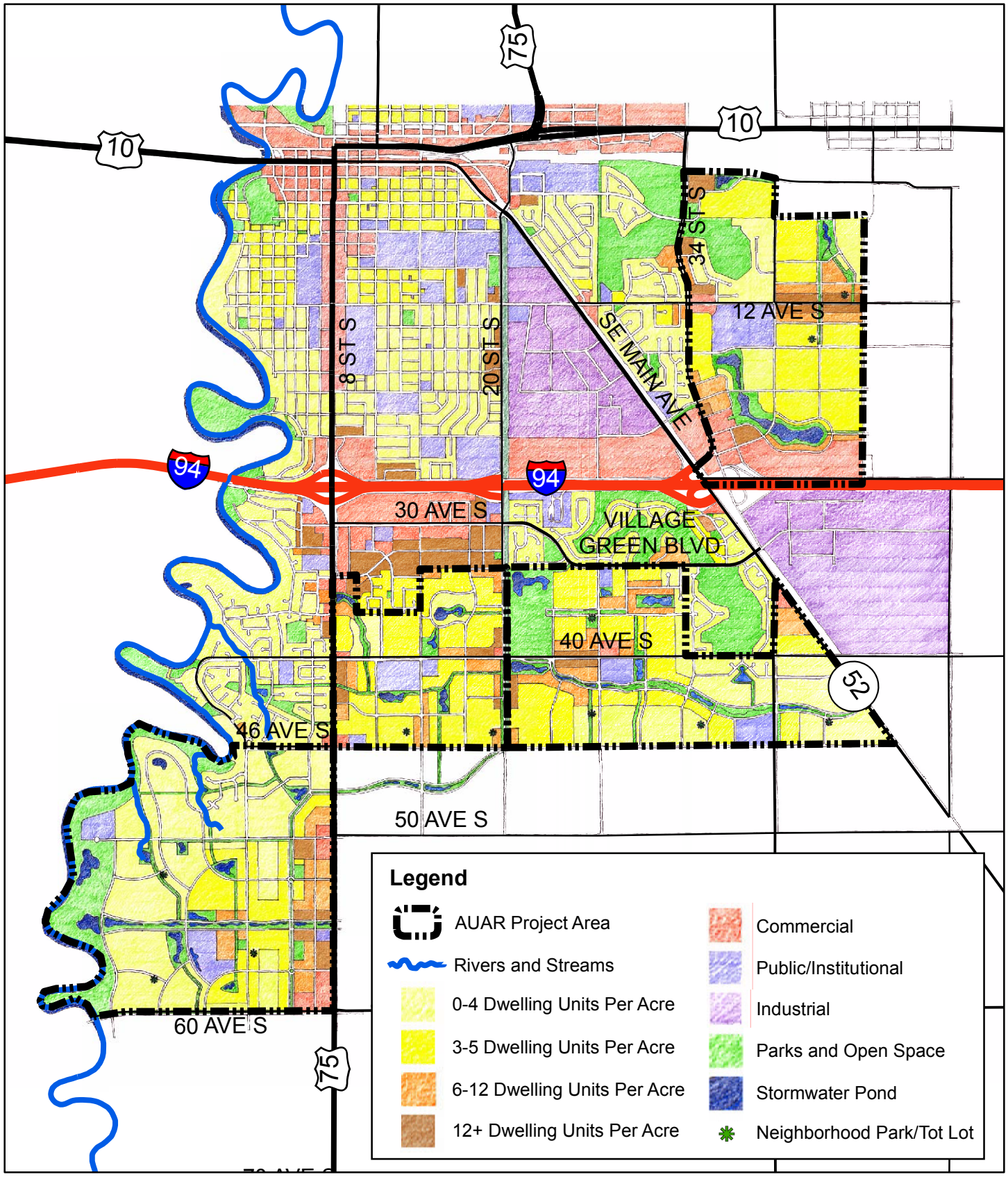

Figure 6.1 - Growth Area Plan (GAP)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

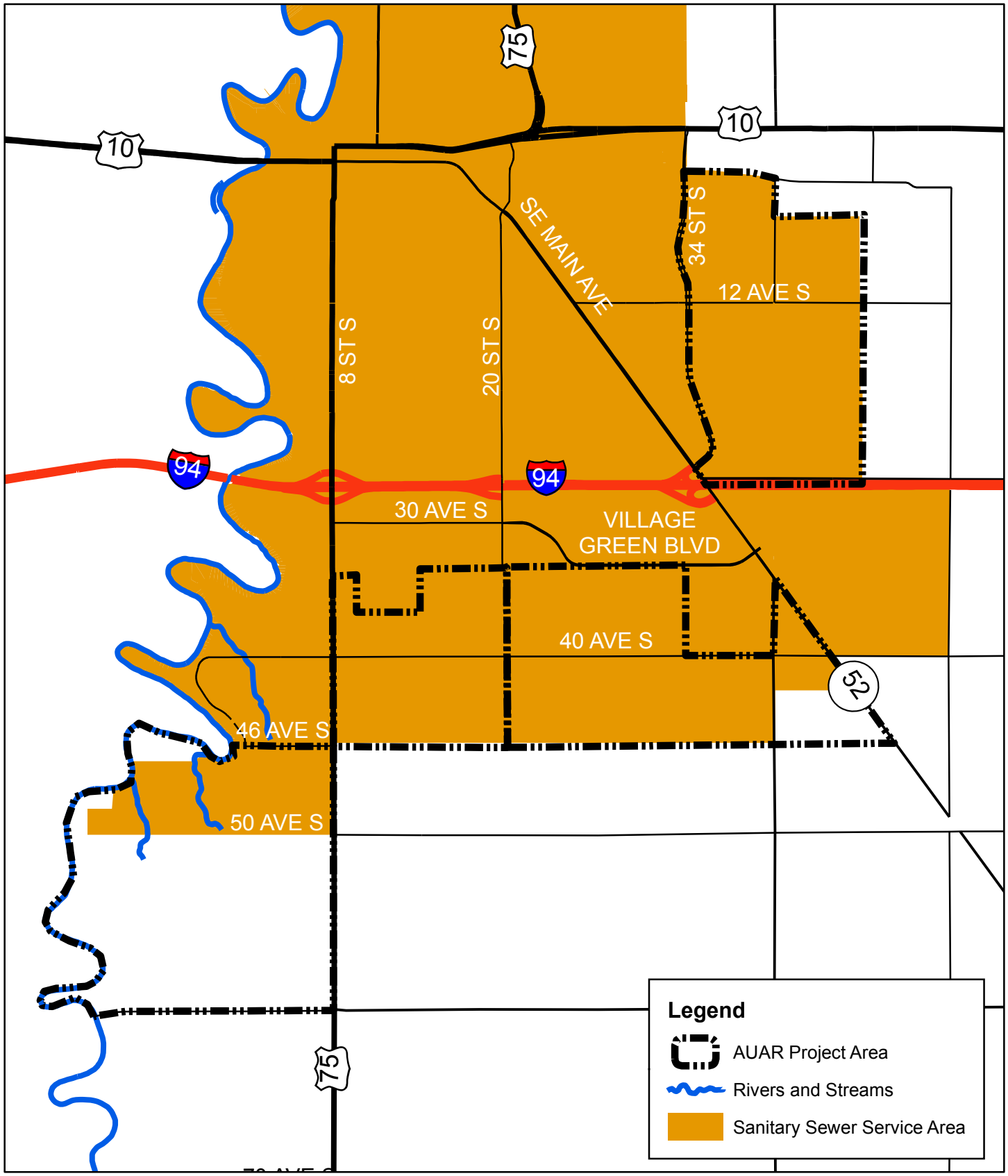

Figure 6.2 - Existing Sanitary Sewer Service Area

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDOT, Fargo-Moorhead Metropolitan Council of Governments, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

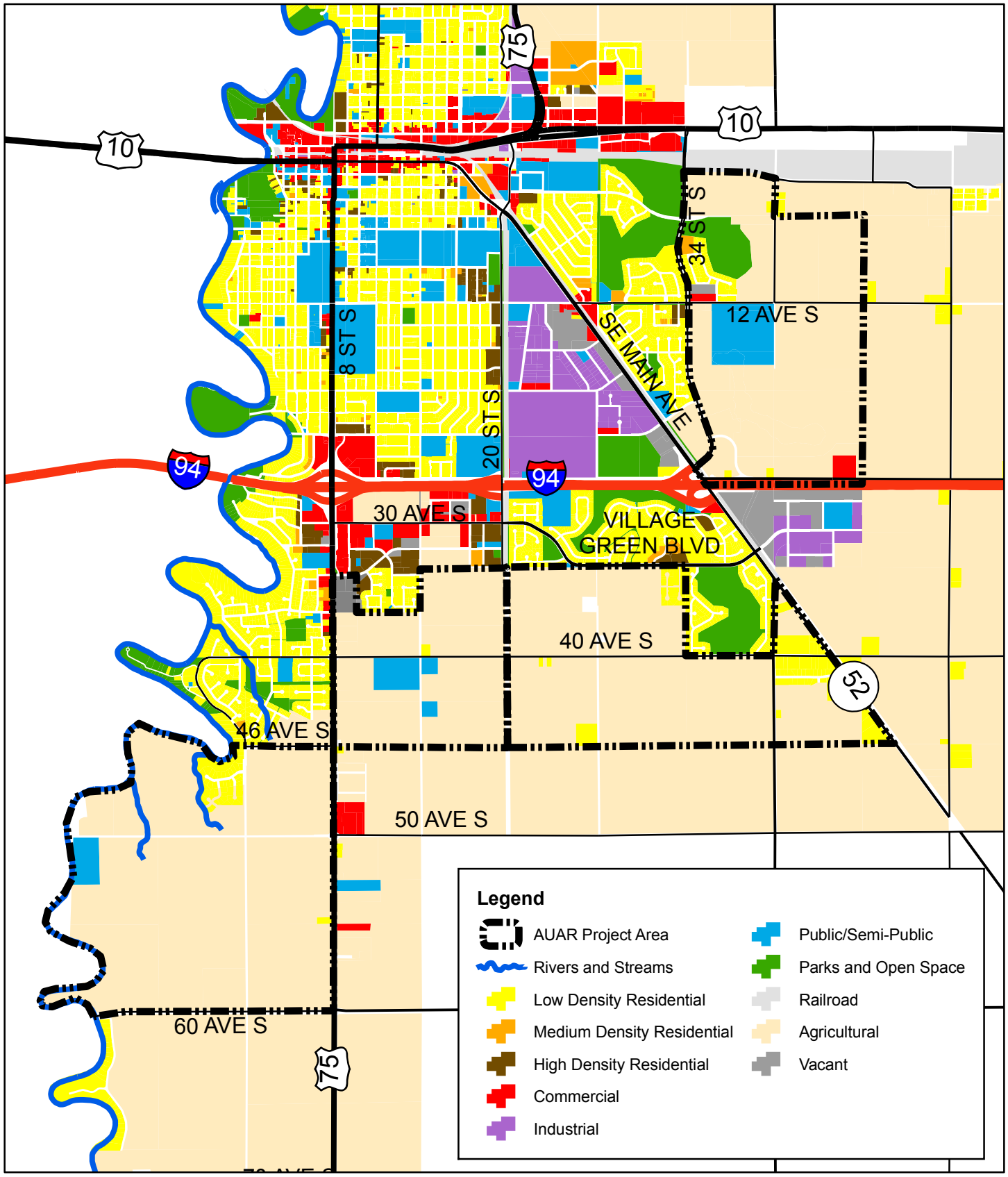

Figure 9.1 - Existing Land Use

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDOT, Clay County, Cass County and City of Moorhead

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

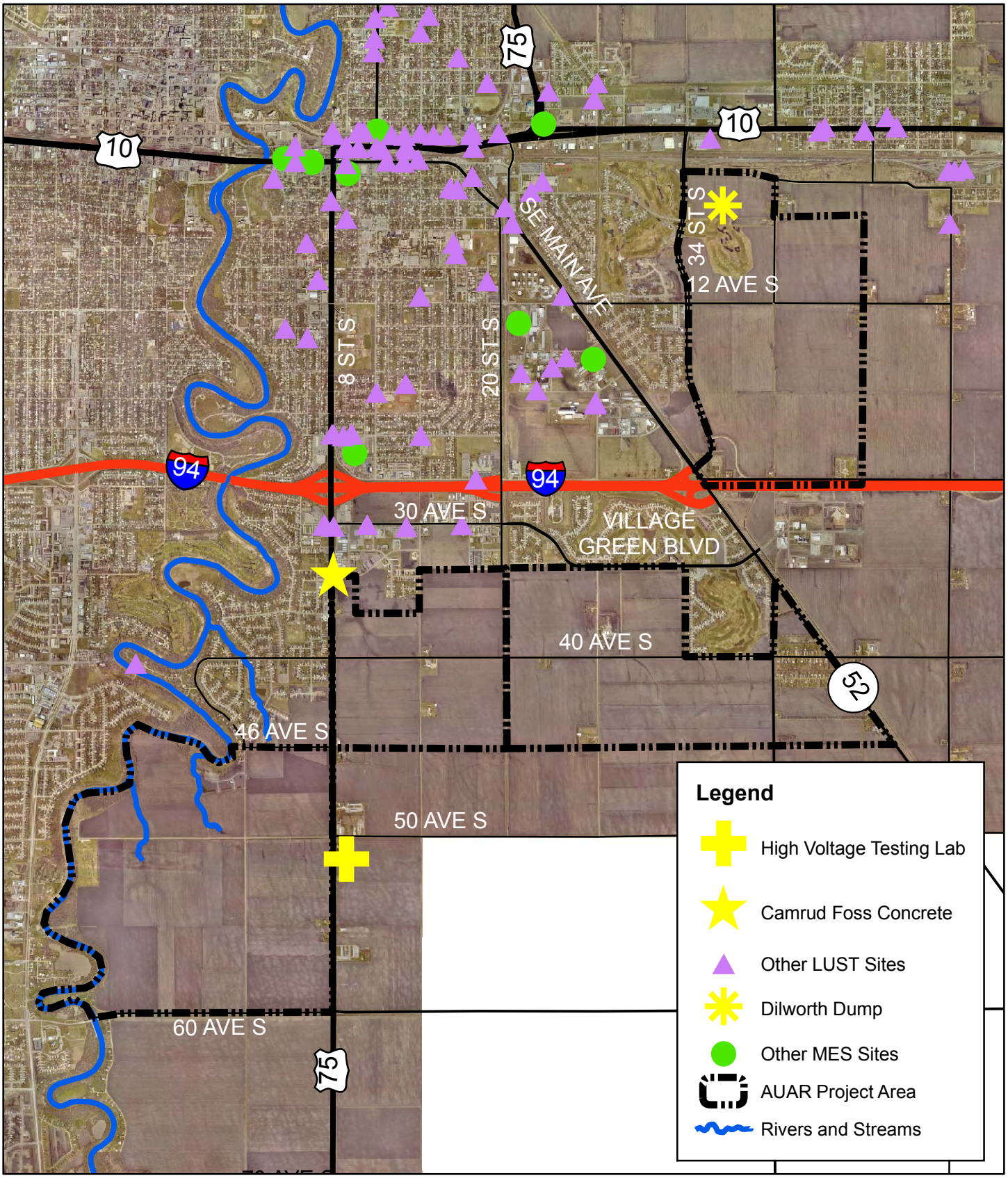

Figure 9.2 - Sites of Environmental Concern

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MPCA, MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

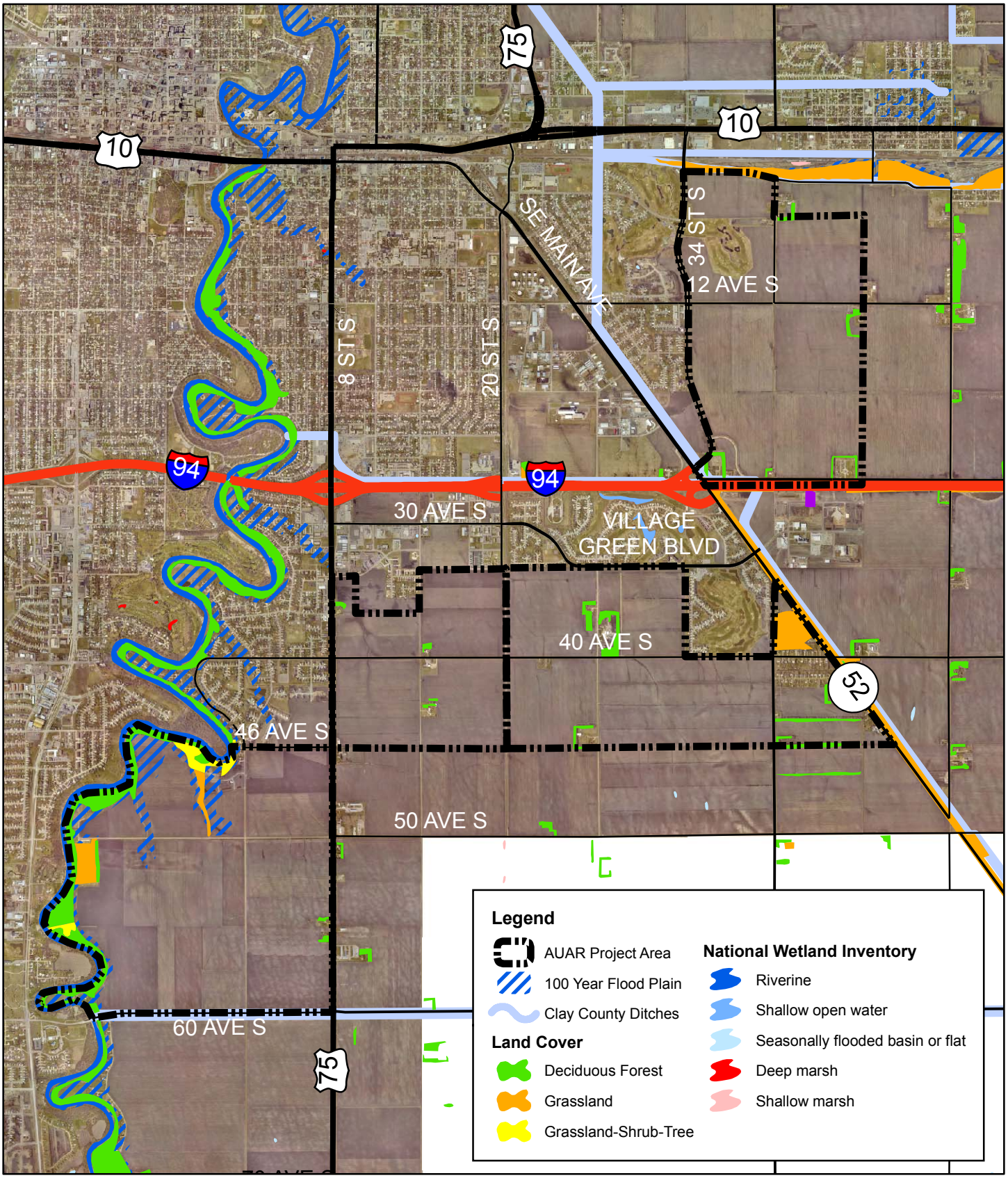

Figure 10.1 - Land Cover

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDNR, MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

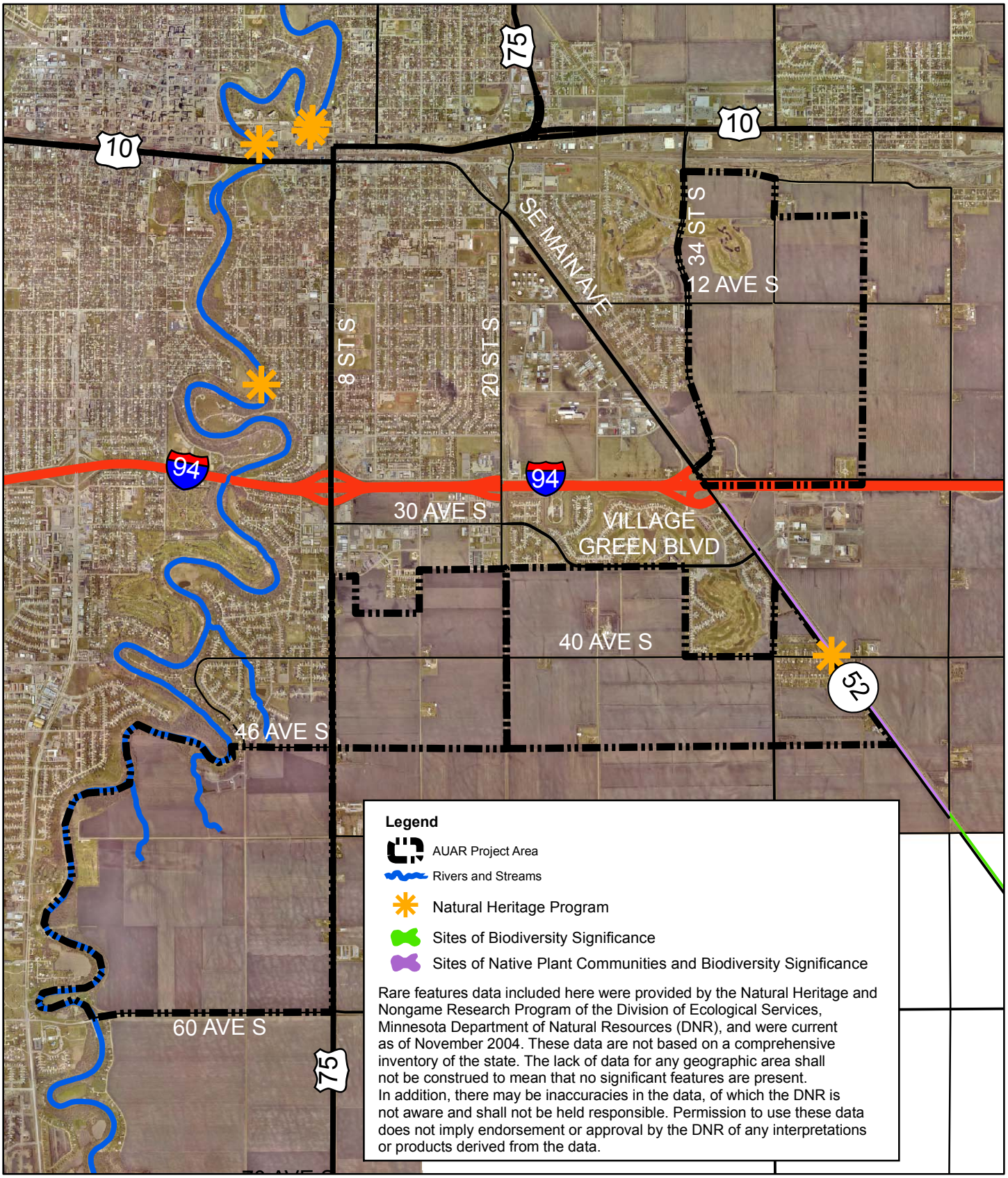

Figure 10.2 - Sensitive Environmental Features

January 2005

Growth Area for South and East Moorhead Alternative Urban Areawide Review

Source: MnDNR, MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

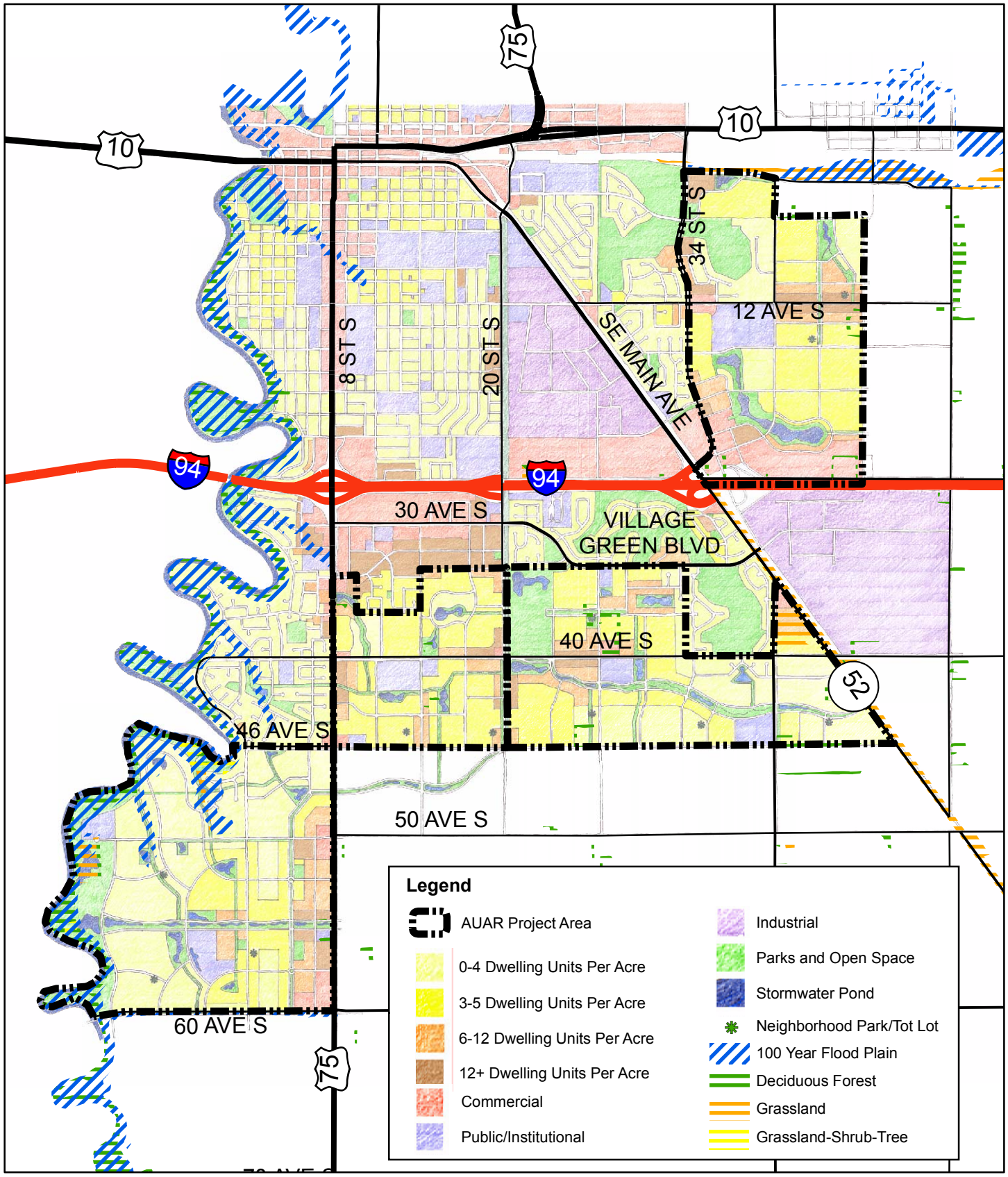

Figure 10.3 - Natural Resources Overlay

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDNR, MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

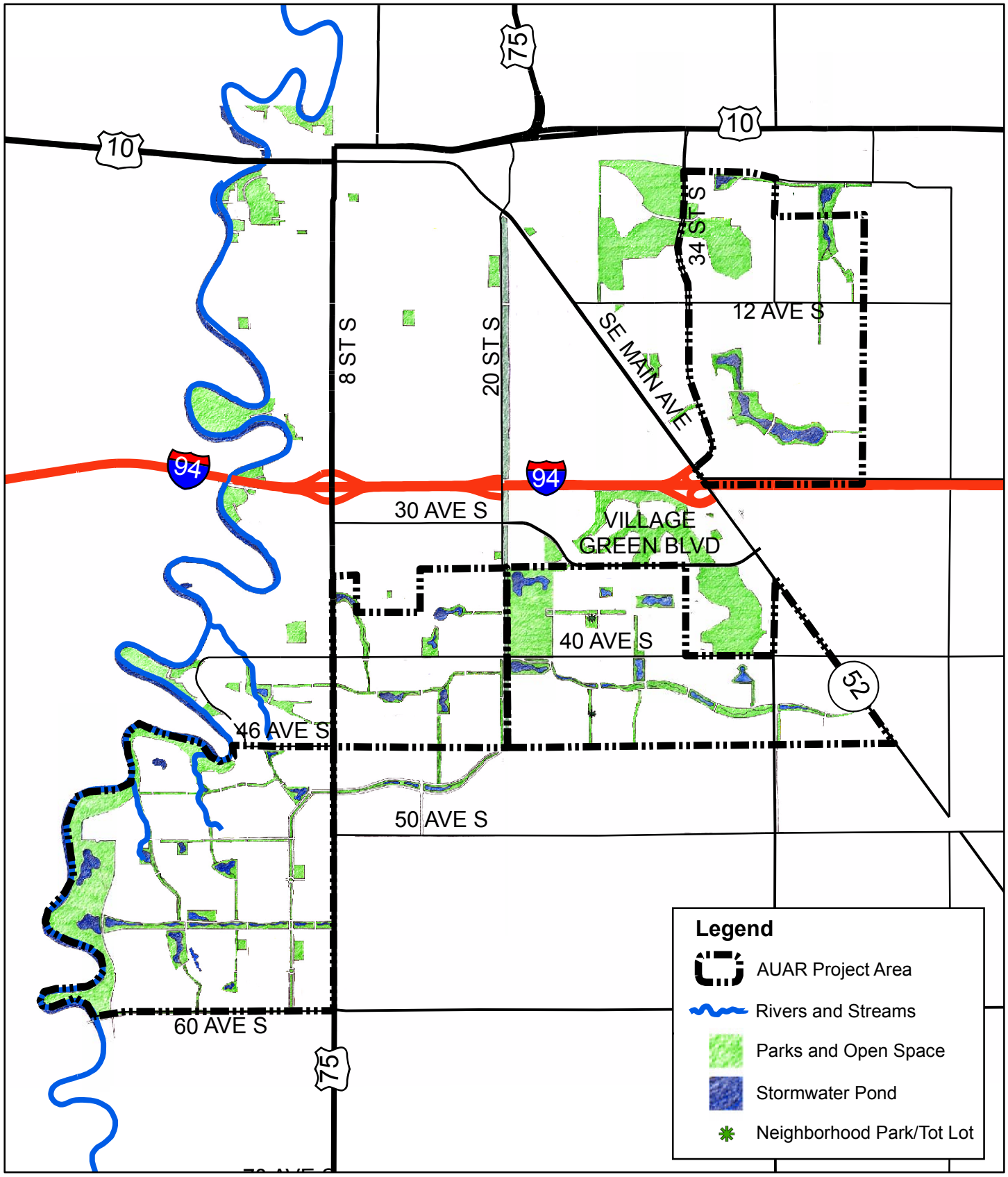

Figure 17.1 - Proposed Storm Water System

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

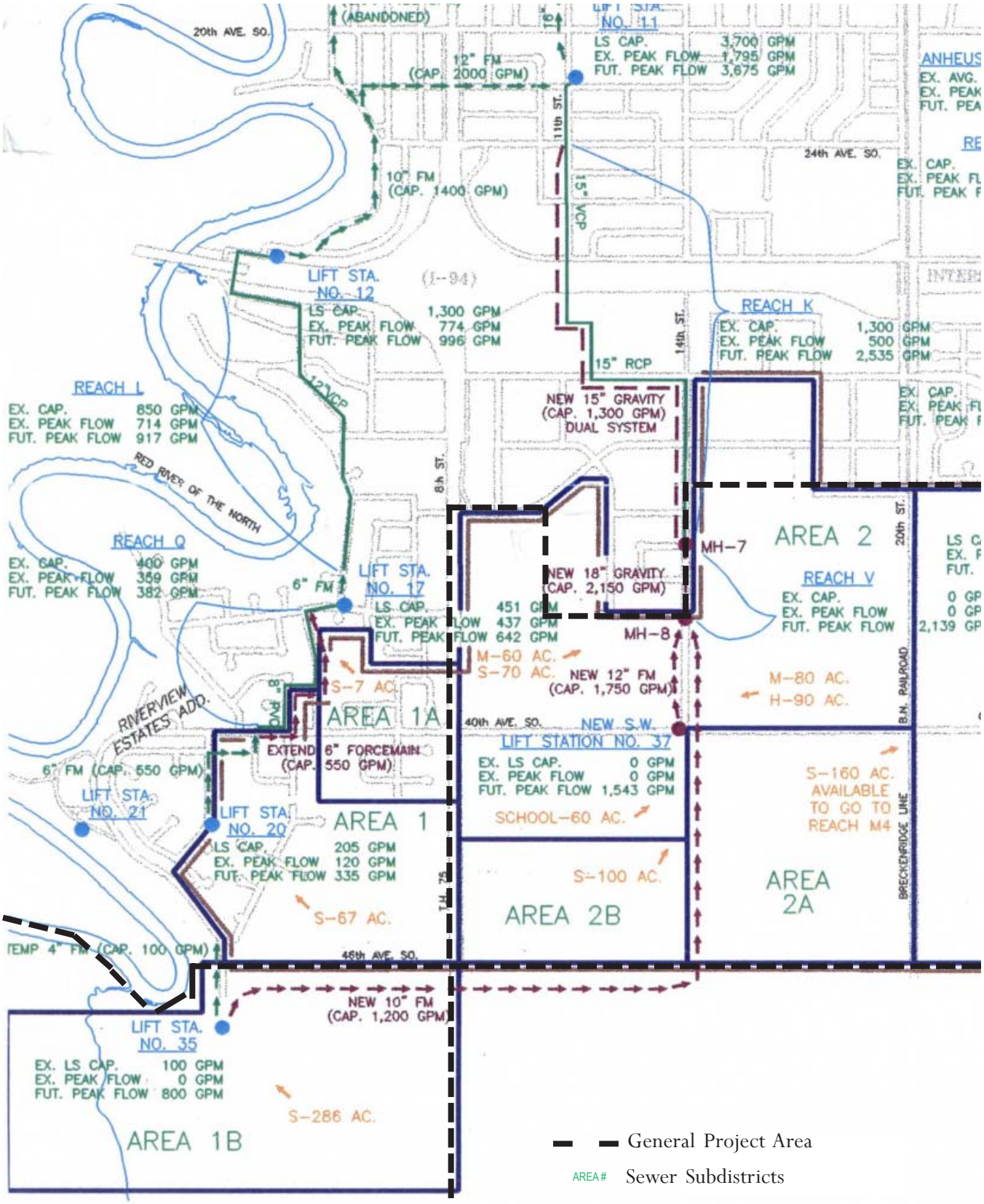

Figure 18.1 - Sanitary Sewer System (southwest of I-94)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: Figure 4 from the Evaluation Report East Side and South Side Sanitary Sewer Collection System prepared for the City of Moorhead by Bonestroo, Rosene, Anderlik & Associates

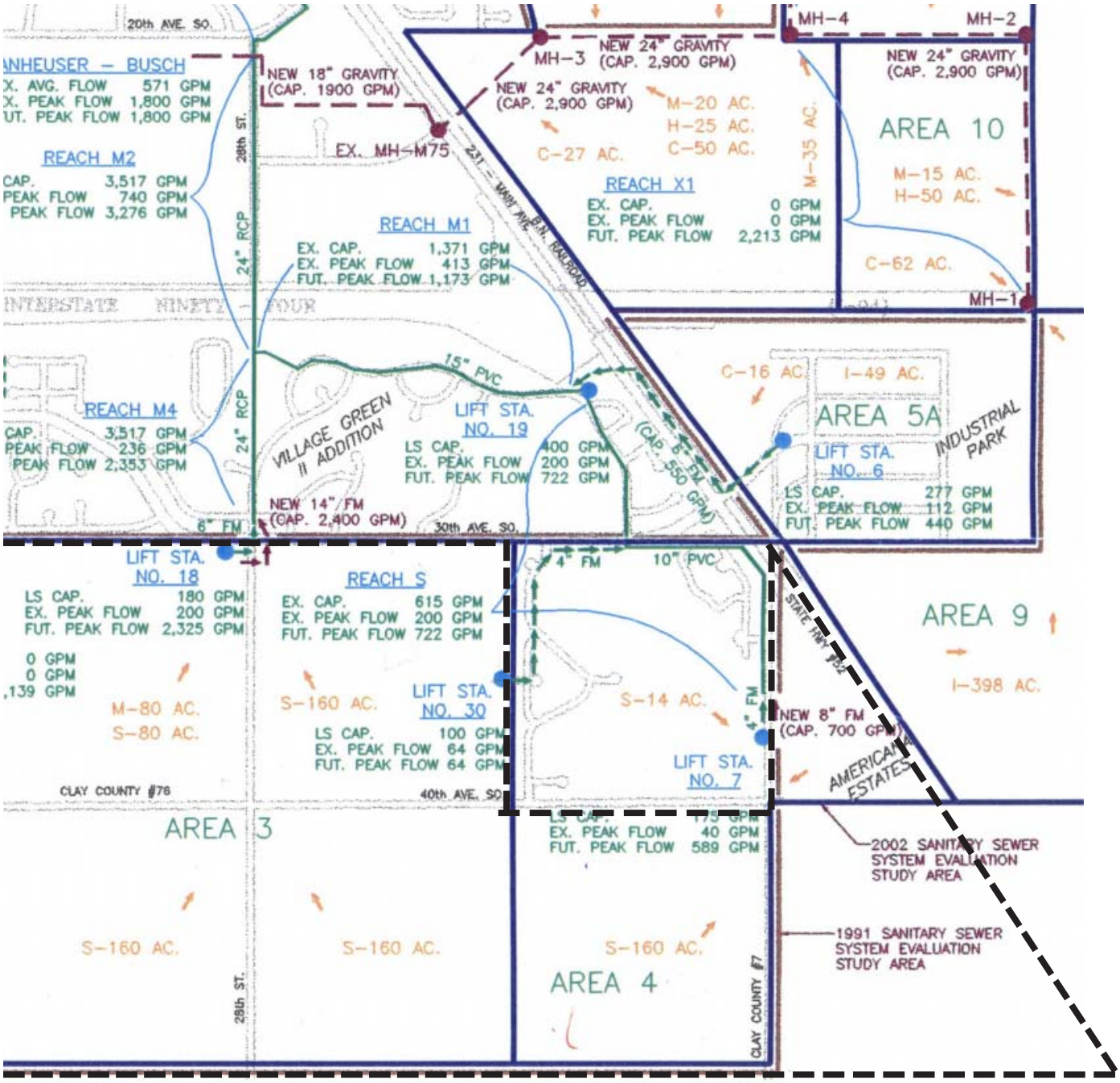

Figure 18.2 - Sanitary Sewer System (southeast of I-94)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: Figure 4 from the Evaluation Report East Side and South Side Sanitary Sewer Collection System prepared for the City of Moorhead by Bonestroo, Rosene, Anderlik & Associates

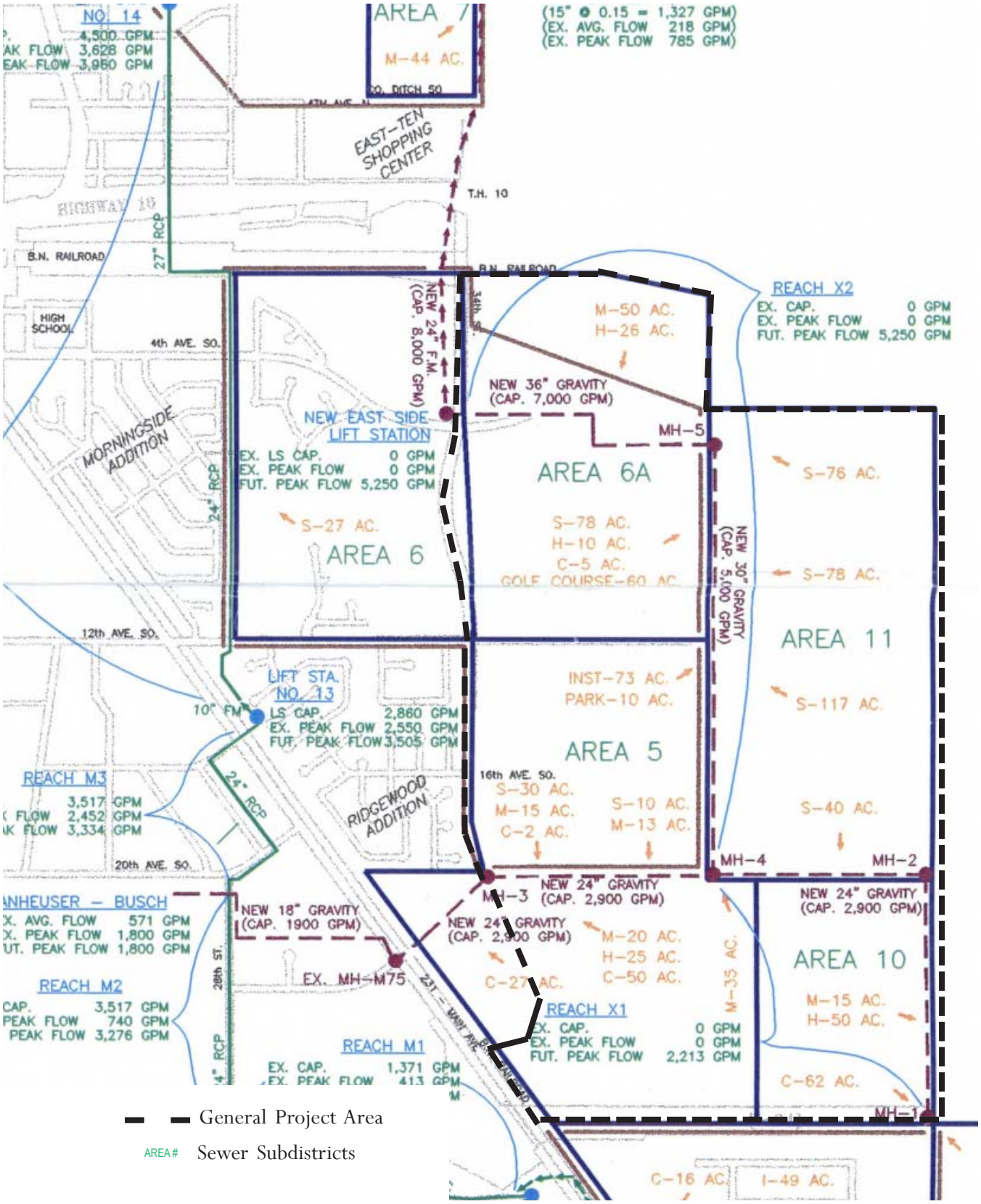

Figure 18.3 - Sanitary Sewer System (north of I-94)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: Figure 4 from the Evaluation Report East Side and South Side Sanitary Sewer Collection System prepared for the City of Moorhead by Bonestroo, Rosene, Anderlik & Associates

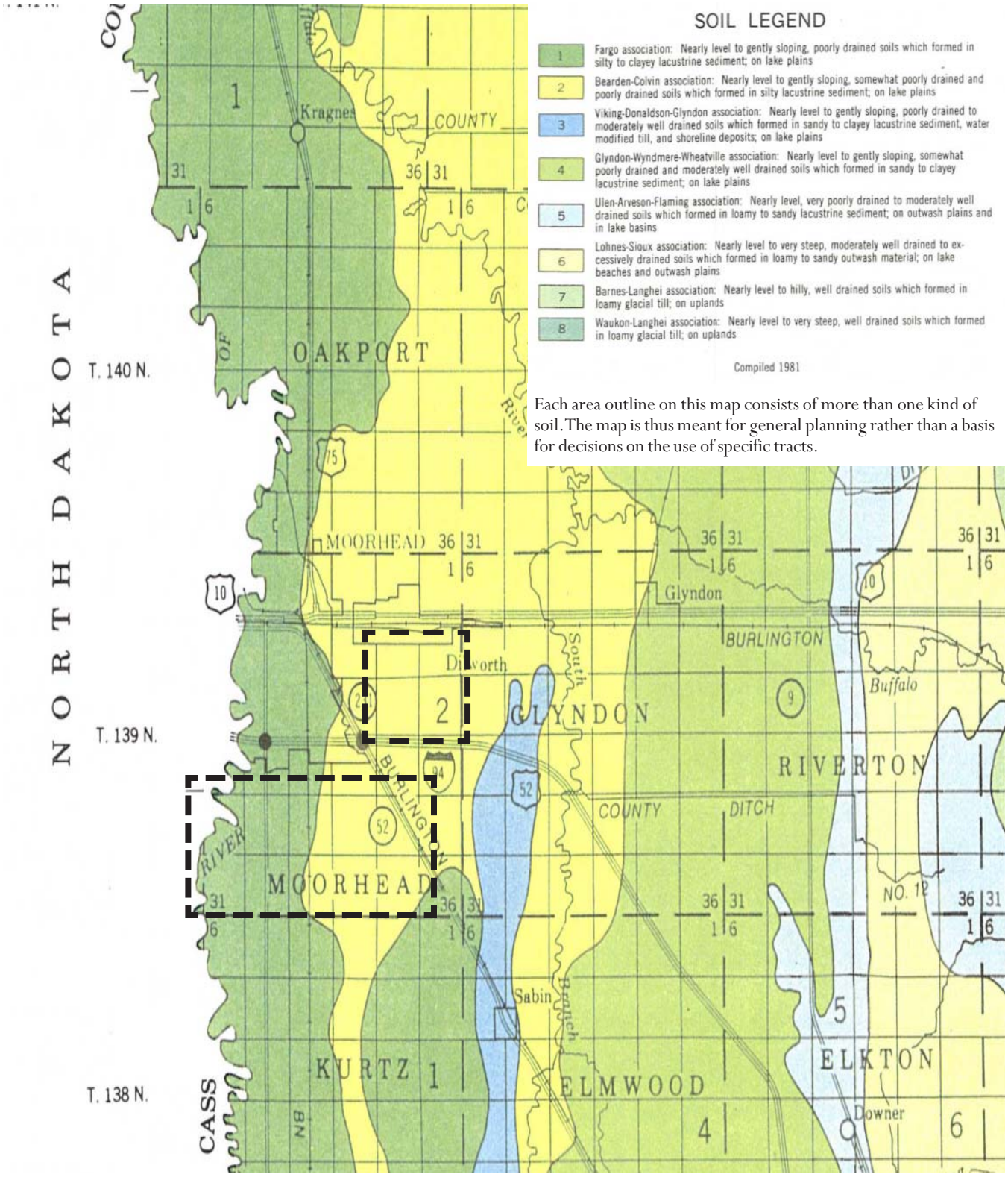

Figure 19.1 - Soils Map

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: Figure 2-7 from Clay County's 2002 Comprehensive Plan prepared by Dahlgren, Shardlow and Uban, Inc.

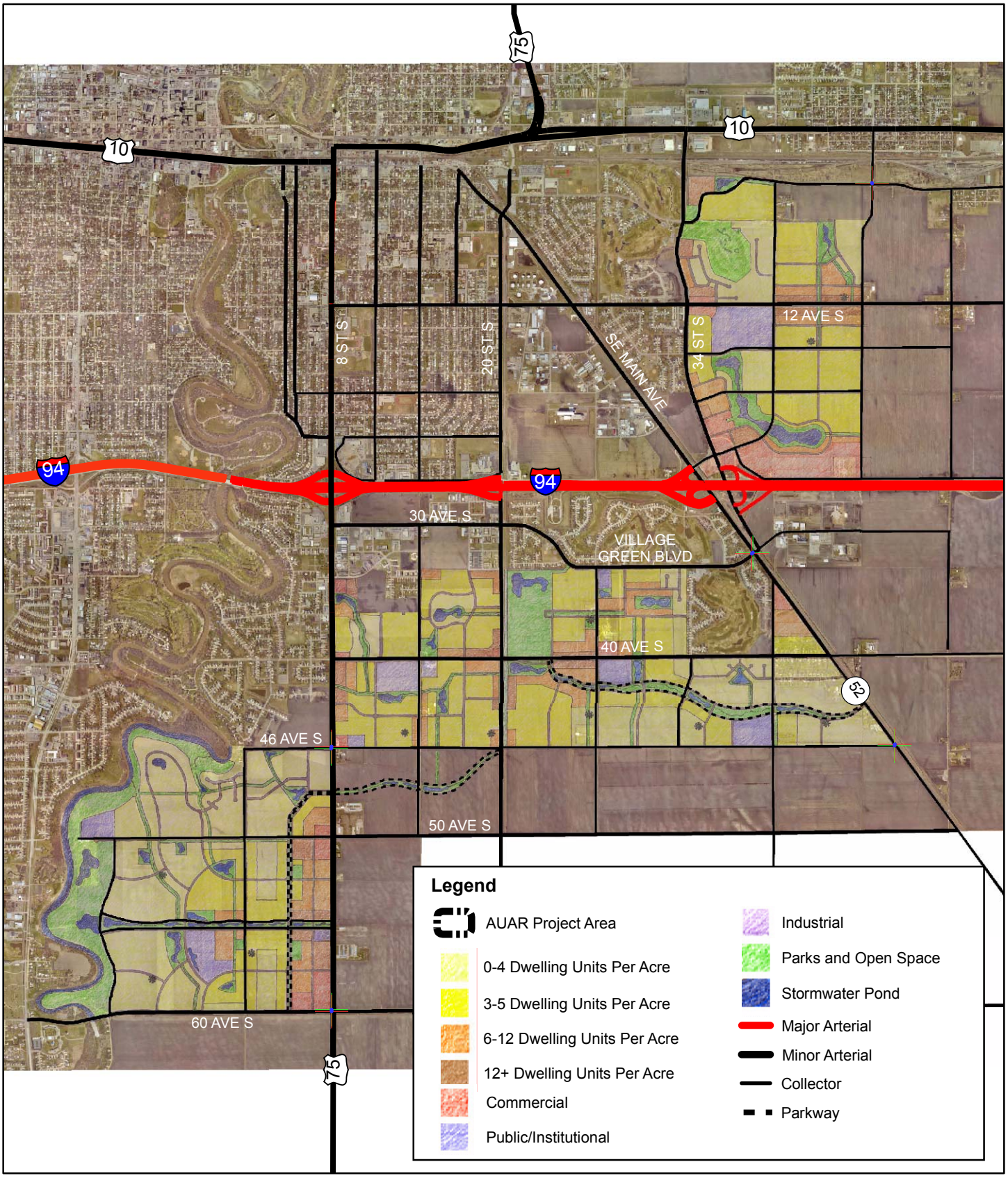

Figure 21.1 - Roadway System

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: SHPO, MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

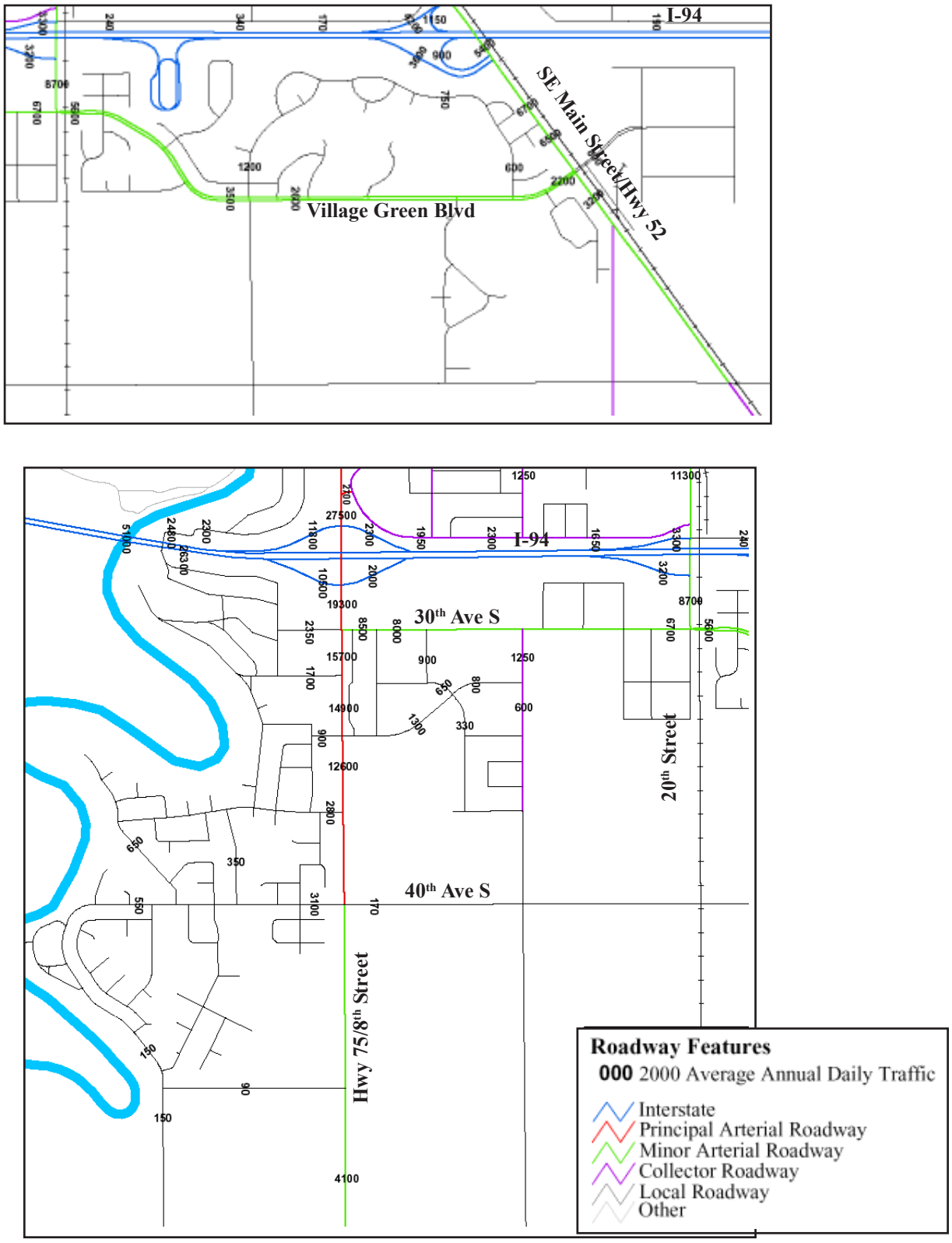

Figure 21.2 - 2000 Average Daily Traffic (south of I-94)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: FMCOG website

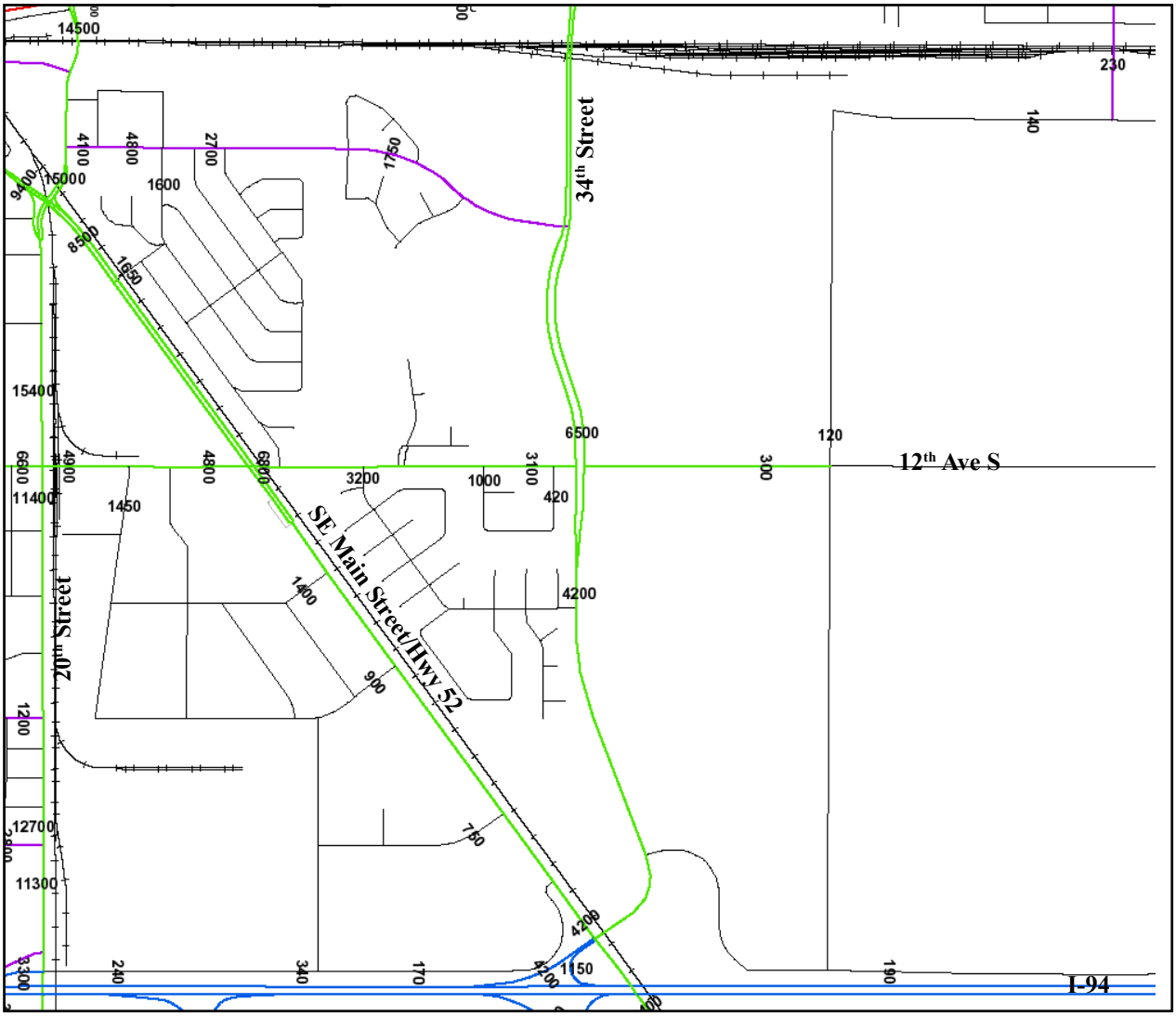

Figure 21.3 - 2000 Average Daily Traffic (north of I-94)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: FMCOG website

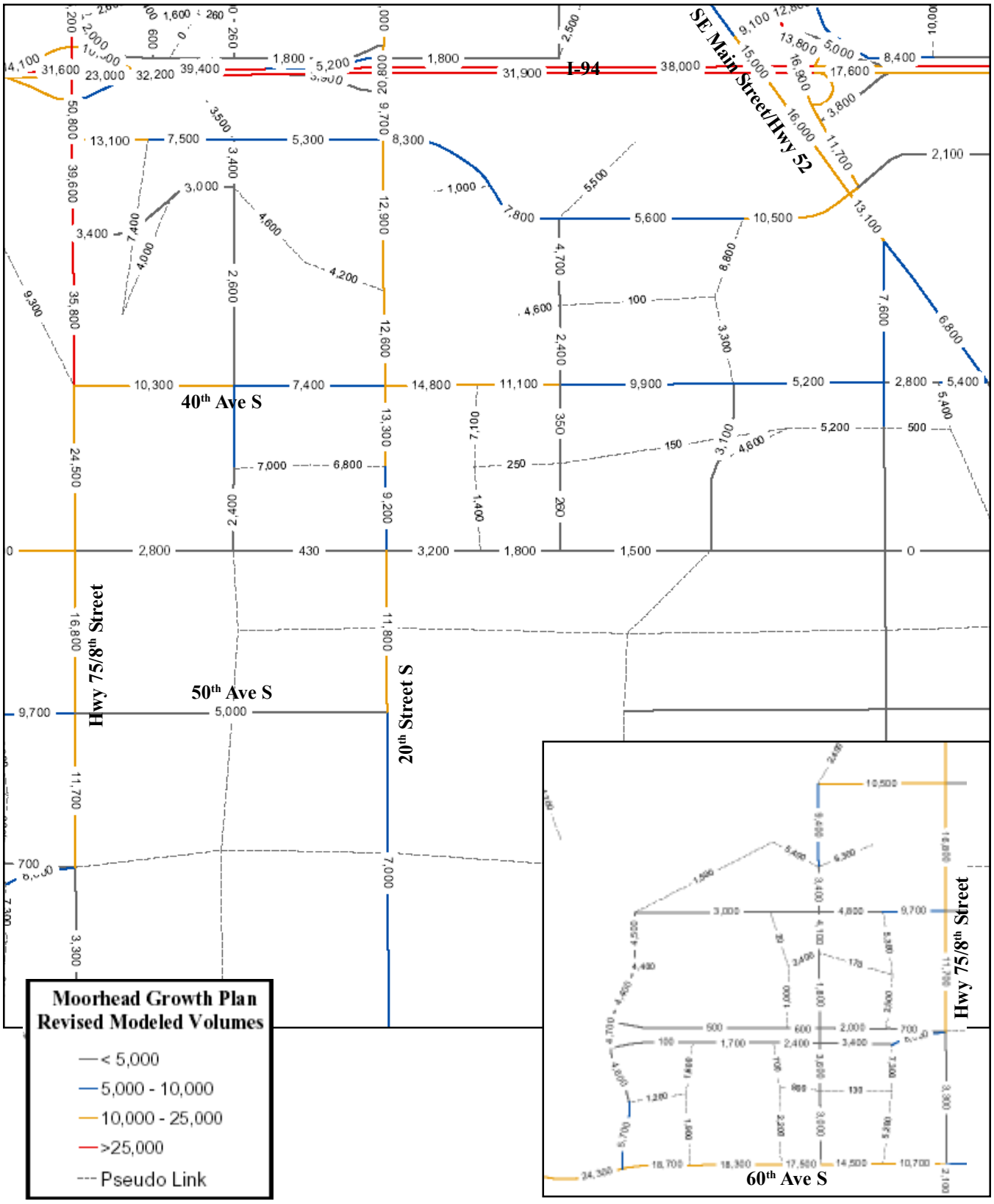

Figure 21.4 - Build Out Average Daily Traffic (south of I-94)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: FMCOG - ATAC based on Growth Area Plan Development Concept and Roadway Network

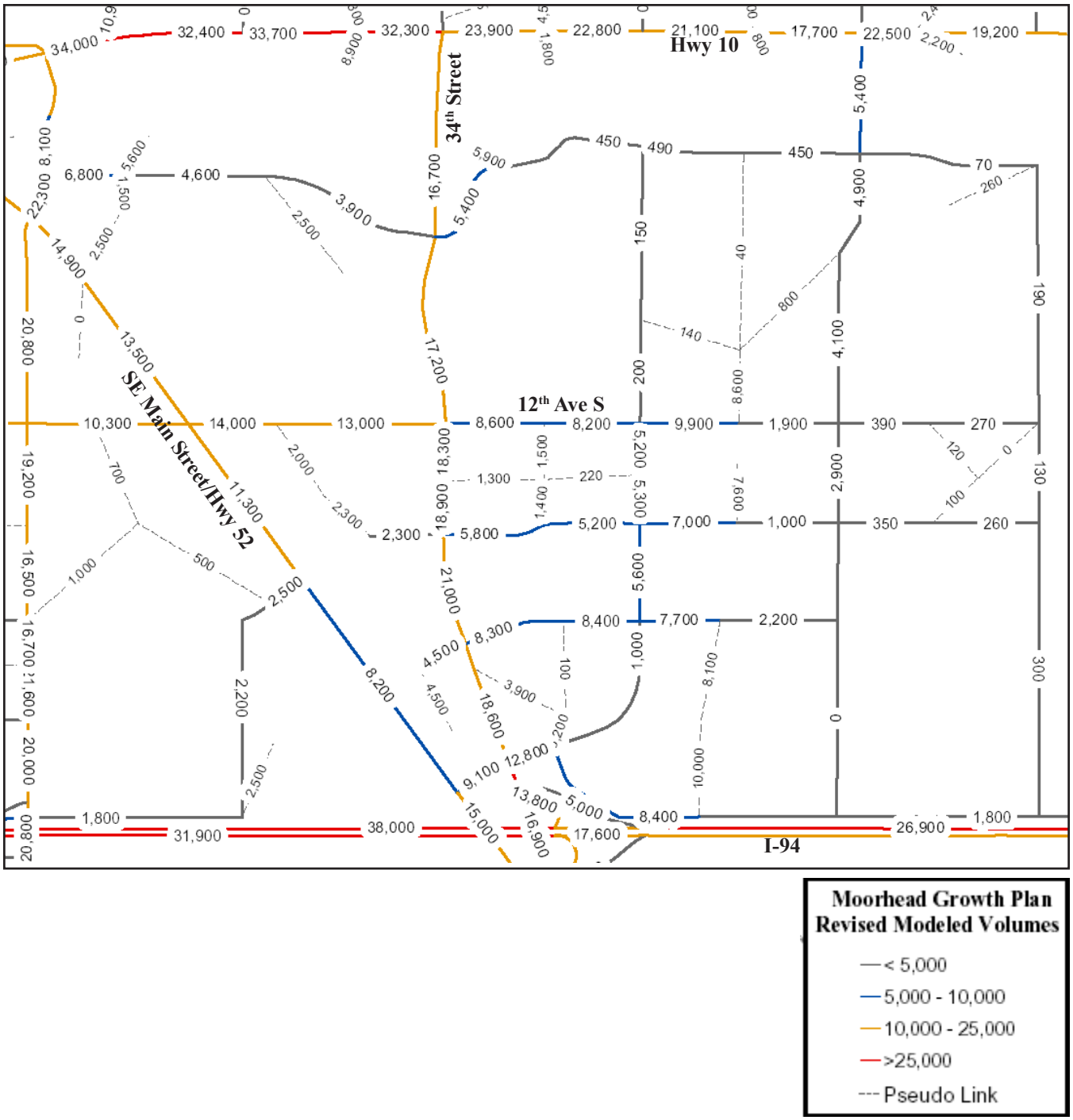

Figure 21.5 - Build Out Average Daily Traffic (north of I-94)

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: FMCOG - ATAC based on Growth Area Plan Development Concept and Roadway Network

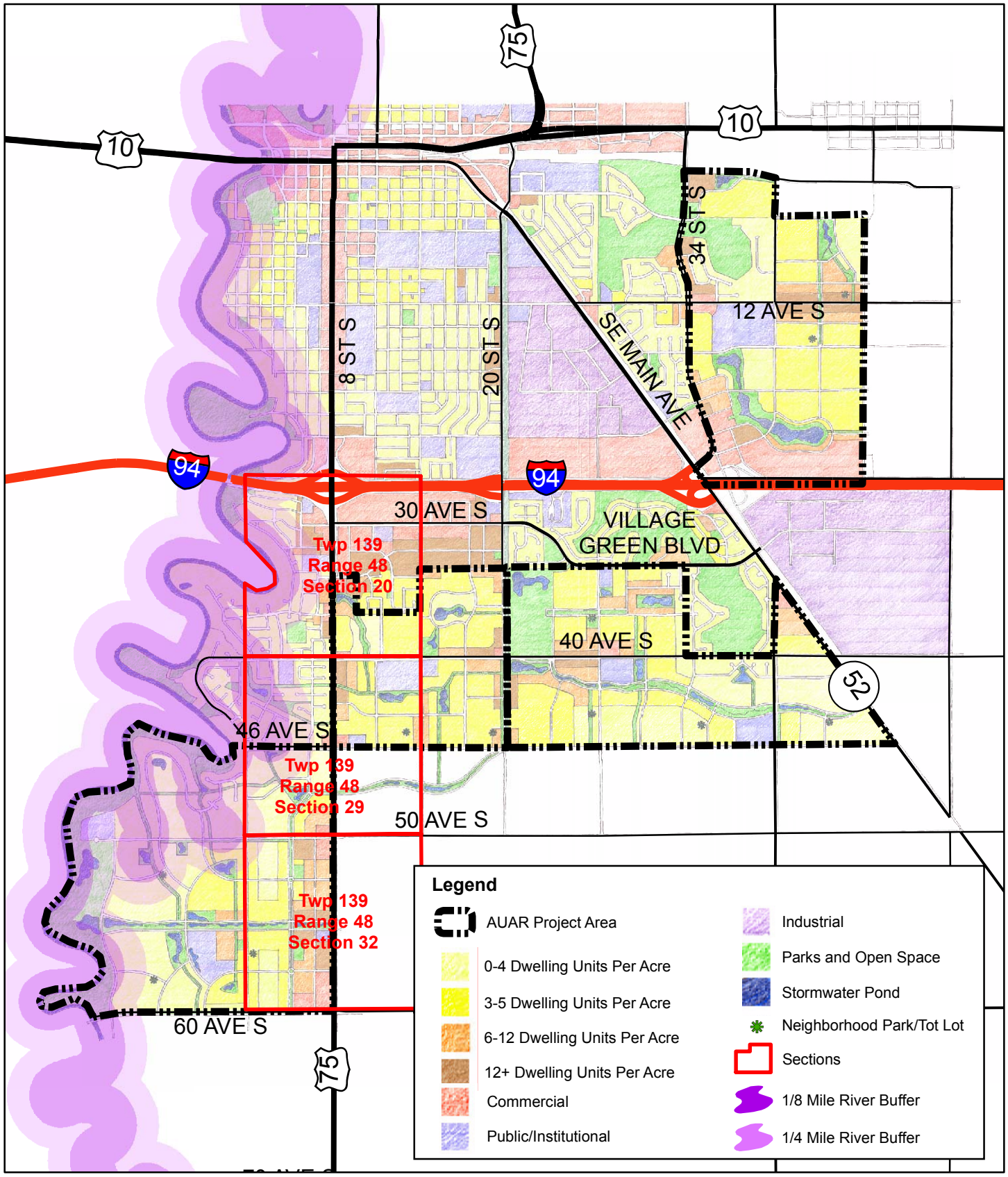

Figure 25.1 - Cultural Resources Overlay

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: SHPO, MnDOT, Clay County, and Cass County

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

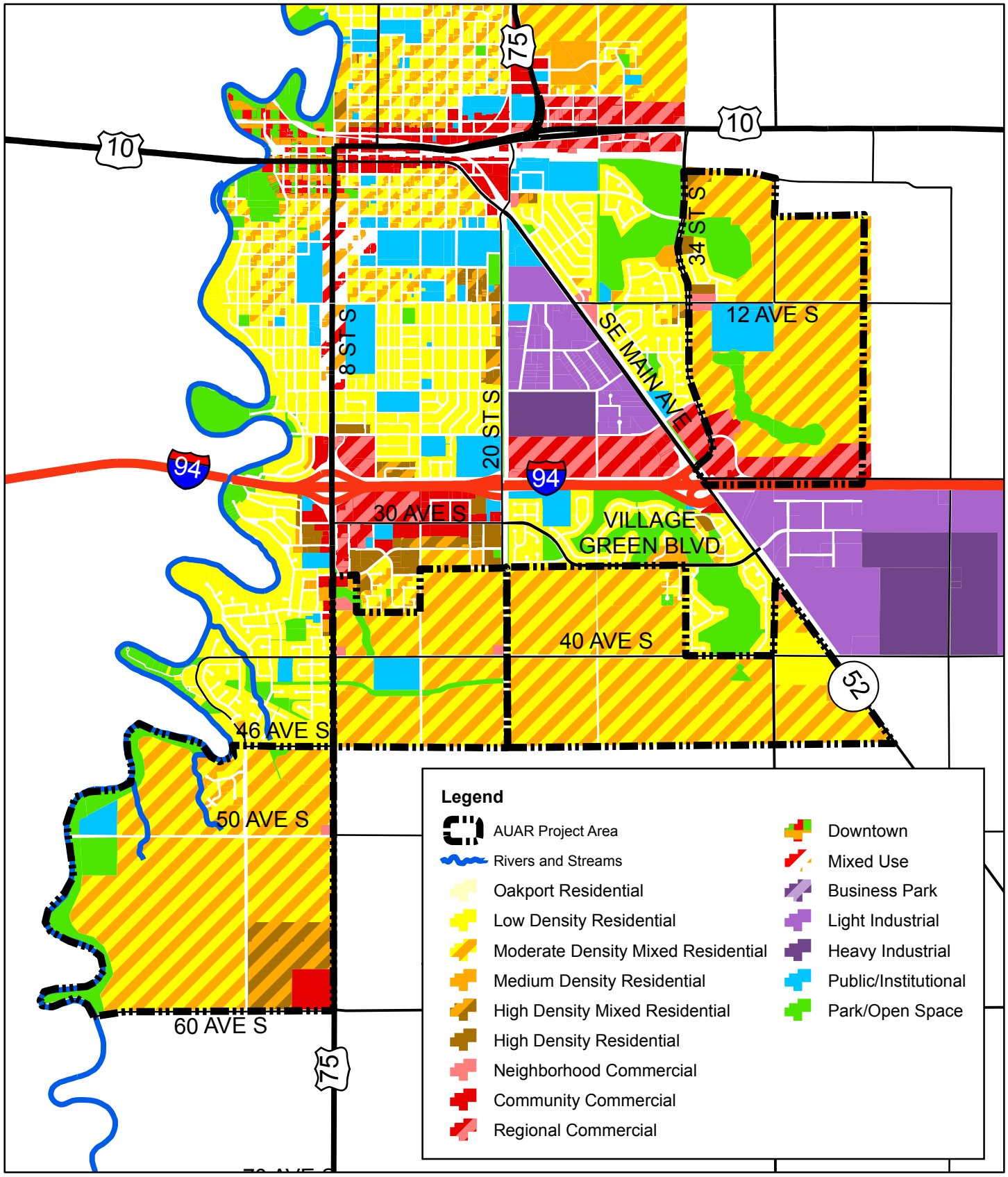

Figure 27.1 - City of Moorhead Comprehensive Plan

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: MnDOT, Clay County, Cass County and City of Moorhead

0 0.25 0.5 1 Miles

Hoisington Koegler Group, Inc

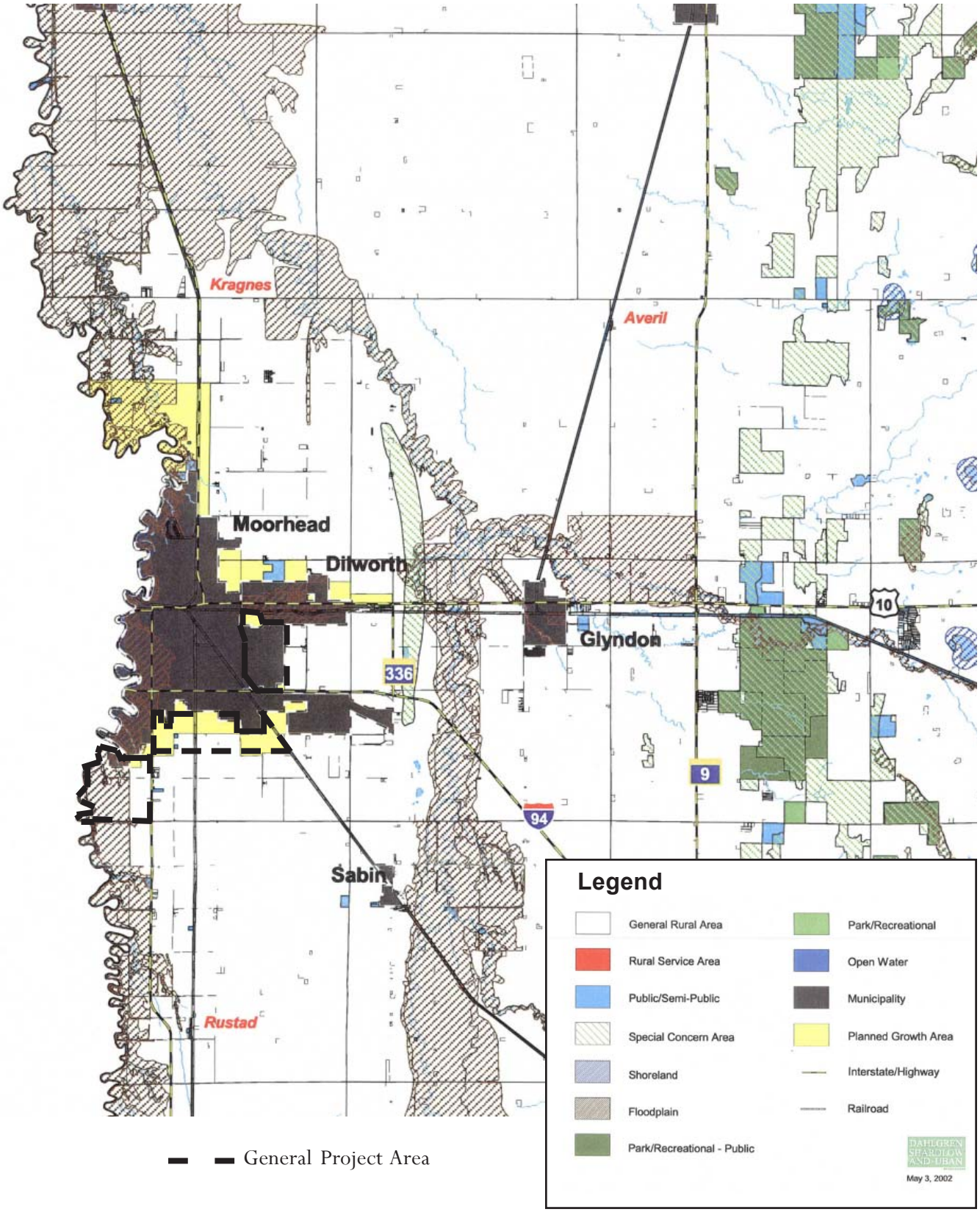

Figure 27.2 - Clay County Comprehensive Plan

January 2005

Growth Area for South and East Moorhead
Alternative Urban Areawide Review

Source: Figure 4-1 from Clay County's 2002 Comprehensive Plan prepared by Dahlgren, Shardlow and Uban, Inc.

Appendix A
Resolution Ordering AUAR

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RESOLUTION ORDERING AN ALTERNATIVE URBAN AREAWIDE REVIEW (AUAR) FOR THE SOUTH AND EAST GROWTH AREAS OF MOORHEAD

WHEREAS, the City of Moorhead adopted a Comprehensive Plan in July of 2004 which identified future growth to the south and east; and,

WHEREAS, the City recognizes the need to begin planning for the future development of land identified in its growth areas so a coherent community results over the long term and infrastructure facilities are utilized in the most efficient manner; and,

WHEREAS, the City's Growth Area Plan establishes a more detailed land use pattern which would implement the Comprehensive Plan and identify appropriate levels of open space and needed infrastructure to ensure that infrastructure systems are capable of meeting future growth demands; and,

WHEREAS, an Alternative Urban Areawide Review (AUAR) is a substitute form of environmental review that replaces an Environmental Assessment Worksheet (EAW) or Environmental Impact Statement as provided for in Minnesota Rules Chapter 4410.3600 and is a more appropriate form of environmental review that evaluates cumulative impacts over a larger area; and,

WHEREAS, the City of Moorhead is the Responsible Governmental Unit (RGU) assigned the responsibility of conducting the AUAR; and,

WHEREAS, Minnesota Rule 4410.3610 (AUAR Process) Subpart 3 requires an "order for review" to define the review area boundaries and the "anticipated nature, location and intensity" of projected future development; and,

WHEREAS, the project area includes approximately 3,700 acres on the south and east sides of Moorhead and are further identified on the project area map attached as Exhibit A; and,

WHEREAS, the AUAR will explore the impacts of growth in accordance to the Comprehensive Plan and Growth Area Plan; and,

WHEREAS, the Comprehensive Plan and Growth Area Plan land use designations for the project area include a combination of residential, commercial, public, institutional, park and open space; and

NOW, THEREFORE, BE IT RESOLVED that the City of Moorhead hereby adopts this Order for Review for the South and East Moorhead Growth Area AUAR.

PASSED by the City Council of the City of Moorhead this 6th day of December, 2004

APPROVED BY:

/s/ Mark Voxland
MARK VOXLAND, Mayor

ATTEST:

/s/ Becky L. Jahnke
BECKY L. JAHNKE, Deputy City Clerk

(SEAL)

STATE OF MINNESOTA
COUNTY OF CLAY
CITY OF MOORHEAD } ss

I do hereby certify that the foregoing instrument is a true and correct copy of said document passed to and adopted by the City Council of the City of Moorhead, Minnesota at a duly authorized meeting thereof held on the 6 day of Dec, 20 04
I further certify that the document was not later rescinded or modified and is still in force and effect.
Dated this 21 day of Jan, 20 05
Kaye Buckanok
City Clerk

#2004-1204

Appendix B
Agency Notification Letter

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October, 29, 2004

Contact

Agency

Address

City, State ZIP

Dear Contact,

The purpose of this letter is to obtain information about the potential impacts of growth that may exist in or near the proposed growth area of Moorhead in Clay County, Minnesota. As the attached figure illustrates, the project area includes part or all of Section 6, Township 138, Range 48; Sections 10-11, 14-15, 20-23 and 26-32 of Township 139, Range 48; and Sections 25 and 36 of Township 139, Range 49.

The Moorhead Alternative Urban Areawide Review (AUAR) is being prepared to address the cumulative impacts of future development in the City of Moorhead. The approximately 4,000 acre project area is generally located on the south and east sides of the community. The AUAR will explore the impacts of development which follows the City's 2004 Comprehensive Plan. The Comprehensive Plan envisions a mixture of land use including residential, commercial, institutional and parks/open space.

If you have any concerns, questions or information that we should be aware of, please feel free to contact Rita Trapp at 612-252-7135 or rita@hkgi.com, Brad Scheib at 612-252-7122 or bscheib@hkgi.com or Jeff Schaumann at 218-299-5374 or jeff.schaumann@ci.moorhead.mn.us. We anticipate sending a draft of the AUAR the week of December 13th. Your timely response to this letter is appreciated.

Sincerely,

Rita Trapp

Planner

Attachment

List of Agencies Receiving Notification Letter

- Jim Haertel of the Board of Water and Soil Resources
- Bruce Albright of the Buffalo-Red River Watershed District
- Ken Park of the City of Dilworth
- Cindy Gray of the City of Fargo
- Tim Magnusson of Clay County
- Mark Peihl of the Clay County Historical Society
- Kevin Kassenborg of the Clay Soil and Water Conservation District
- Becky Balk of the Department of Agriculture
- Marya White of the Department of Commerce
- David Wulff of the Policy, Planning & Analysis Unit of the Environmental Health Division, Department of Health
- Gerald Larson of the Mn/DOT Environmental Services, Department of Transportation
- Jon Larsen of the Environmental Quality Board Environmental Review Program
- Brian Gibson of the Fargo-Moorhead Metropolitan Council of Governments
- Paul Swenson of the Minnesota Department of Natural Resources
- Molly MacGregor of the Minnesota Pollution Control Agency
- Bob Backman of River Keepers
- Tom Cinadr of the State Historic Preservation Office, Minnesota Historical Society
- Dennis Gimmestad of the State Historic Preservation Office, Minnesota Historical Society
- Tamara Cameron of the US Army Corps of Engineers Regulatory Functions Branch, Army Corps of Engineers
- Kenneth Westlake of the US Environmental Protection Agency
- Laurie Fairchild of the US Fish and Wildlife Service Twin Cities Field Office

Clay Soil and Water Conservation District
1506 30th Avenue South, Ste. B ❖ Moorhead MN 56560
Phone: (218)287-2255
Fax: (218)287-1787

November 22, 2004

Hoisington Koegler Group, Inc.
Attn: Rita Trapp
123 North Third Street, Suite 100
Minneapolis, MN 55401-1659

RE: Comments on the Moorhead, MN Alternative Urban Areawide Review (AUAR)

Dear Ms. Trapp and colleagues,

The Clay Soil & Water Conservation District is pleased to provide comments on the upcoming AUAR for future development in the City of Moorhead. There are three major concerns we believe need to be addressed in this initiative; flooding and stormwater control, erosion, and the MN Wetlands Conservation Act.

First, the Red River Valley is prone to frequent spring and summer (and sometimes fall) flooding due to rapid snowmelt and heavy rains. As such, our major concerns with increased development relate to flood damage and the need for adequate flood mitigation. Coupled with development is the change in land use and the ratio of impervious surfaces to pervious groundcover. Stormwater runoff control/storage is critical in this part of the state where flood damage reduction is our standard mode of operation.

Second, the Red River Valley is also prone to wind and water erosion. The issue of concern with Moorhead's future growth is the land use adjacent to the Red River. The Red River is the drinking water supply for the City of Moorhead, thus it is critical that land uses are compatible with erosion standards. The banks of the Red River are unstable and erode quickly when vegetation is removed and encroachment occurs. The Red River Corridor needs to be enhanced through additional "greenway" space and protected to maintain the resource we depend on for daily living.

Third, the Clay SWCD is the Local Government Unit responsible for administering the MN Wetlands Conservation Act. This law regulates the draining and filling of wetlands, and

requires replacement if wetland impacts are unavoidable. The Clay SWCD will need to review the lands indicated on the AUAR prior to actual development. Although we do not anticipate significant wetland resources to be present, the review is necessary.

Development and growth are exciting to consider, especially when conservation can be incorporated into the development design. We encourage that these issues be addressed to allow growth at an extent that allows the management of the natural resources present.

We thank you for the opportunity to respond and provide comment. If you have any questions or require additional comments, please do not hesitate to contact us.

Respectfully,

Kevin Kassenborg
Clay SWCD Manager

Steven C. Hofstad
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AN EQUAL OPPORTUNITY EMPLOYER

From: Cinadr, Thomas [thomas.cinadr@mnhs.org]

Sent: Tuesday, November 02, 2004 9:17 AM

To: rita@hkgi.com

Subject: Moorhead Alternative Urban Areawide Review

Archaeological sites and historic properties were identified in a search of the Minnesota Archaeological Inventory and Historic Structures Inventory for the search area requested. Reports containing the results of the search are attached.

The result of this database search provides a listing of recorded archaeological sites and historic architectural properties that are included in the current SHPO databases. Because the majority of archaeological sites in the state and many historic architectural properties have not been recorded, important sites or structures may exist within the search area and may be affected by development projects within that area. Additional research, including field survey, may be necessary to adequately assess the area's potential to contain historic properties.

With regard to Environmental Assessment Worksheets (EAW), a negative known site/structure response from the SHPO databases is not necessarily appropriate information on which to base a "No" response to EAW Question 25a. It is the Responsible Governmental Unit's (RGU) obligation to verify the accuracy of the information contained within the EAW. A "No" response to Question 25a without written justification should be carefully considered.

If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic architectural properties, you may need to hire a qualified archaeologist and/or historian. Please contact the SHPO by phone at 651-296-5462 or by email at mnshpo@mnhs.org for current lists of professional consultants in these fields.

<<Archaeology.doc>> <<Historic.doc>>

Archaeological Site Locations

Site Number	Site Name	Twp.	Range	Sec.	Quarter Sections	Acres	Phase	Site Description	Traditio	Context	Reports	NR	CEF	DOE
County:	**Clay**													
21CYr	Red River Trail	139	48	20	W	0	0	TR						
	Red River Trail	139	48	29	W-W	0	0	TR						
	Red River Trail	139	48	32	W-W	0	0	TR						

History/Architecture

PROPERTY NAME	ADDRESS	Twp	Range	Sec	Quarters	USGS	Report	NRHP	CEF	DOE	Inventory Number
COUNTY Clay											
CITY/TOWNSHIP: Dilworth											
Northern Pacific Buildings	3rd St. NE & 2nd Ave. SE	139	48	11	SE-NE-NE	Sabin	CY-79-1H				CY-DWC-003
CITY/TOWNSHIP: Moorhead											
American Crystal Sugar Plant	xxx 11th St. N.	139	48	32	NE	Fargo North	CY-79-1H				CY-MHC-058
Moorhead Country Club	11th St. & 18th Ave. N.	139	48	32	SE	Fargo North	CY-79-1H				CY-MHC-064
South Dam	Across the Red River at mile 458.1	139	48	30	NW-NE-NW	Fargo South			Y		CY-MHC-091

Note: Two sites, American Crystal Sugar Plant and Moorhead County Club are not actually in the project area. The Township number appears to be wrong in the SHPO database. It should be 140 not 139. HKGi staff discussed this with Mr. Cinadr of the State Historic Presrvation Office.

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Summary of Phone Conversation

Date: November 9, 2004

HKGI Staff: Rita Trapp

Project: Moorhead AUAR

Contact: Stan Thurlow, Thurlow Planning Office (City Planner)

Organization: City of Dilworth

Phone: 651-296-5462

Subject: Response to Agency Notification Letter

Summary:

Stated that City of Dilworth has an interest in what is planned for the northeastern part of the project area. The project area borders the City of Dilworth. The City of Dilworth will soon be undertaking an update of their Comprehensive Plan. They want to work with the City of Moorhead to ensure roads and utilities connect effectively.

Summary of Phone Conversation

Date: November 4, 2004

HKGI Staff: Rita Trapp

Project: Moorhead AUAR

Contact: Bob Backman

Organization: River Keepers

Phone: 701-241-3600 (701-241-4075 fax)

Subject: Response to Agency Notification Letter

Summary:

Called to express concerns and thoughts he has, not necessarily on behalf of River Keepers.

- Would like to see the City maximize residential development in the downtown urban area before sprawling out.
- Would like to see public ownership or easements of land along the Red River.
- Had heard some concerns about the potential for increased usage of Fargo's boat ramp just north of Fargo's 52nd Ave (60th Ave S in Moorhead)
- Has concerns about building in the floodplain – especially since taxpayers usually have to pay later to protect the homes, repair damaged homes or buy them out
- Recommended that public areas should be signed to prevent future problems if the use of the area changes, such as adding a path to an area that has been left natural
- Suggested that, if purchased, some of the open/green space be left in a natural setting or a setting that needs a minimum amount of maintenance. If left natural then some of funds currently used for maintenance such as mowing could be spent on other park needs.
- Shared some experiences of other communities. Winnipeg has made an effort to purchase land along the river to build bike paths and walking trails. Research has shown that property values do increase along these public areas. Also mentioned that Fargo recently put in a bike path from midtown dam to park across from Gooseberry. Neighbors opposition has generally turned to support now that they have that amenity close to them.
- Mentioned that there is an issue with slumping in the area. Homes south of 60th Ave S have had to be removed because the ground and structures on it were moving toward the river. He explained that it is occurring because of the composition of the soil. He thought that there were not a lot of affordable options when it happens. Recommended a conversation with Professor Schwert at North Dakota State University for more information.